AMERICAN
CINEMATOGRAPHER
The Motion Picture CAMERA Magazine

this issue

Arnold Re-elected President
Agfa Infra Red Film
Automatic Camera Control
European Camera Problems
Eastman Film Explained
. . . and other features

MAY,
1936

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GABLE HARLOW LOY
WIFE VERSUS SECRETARY

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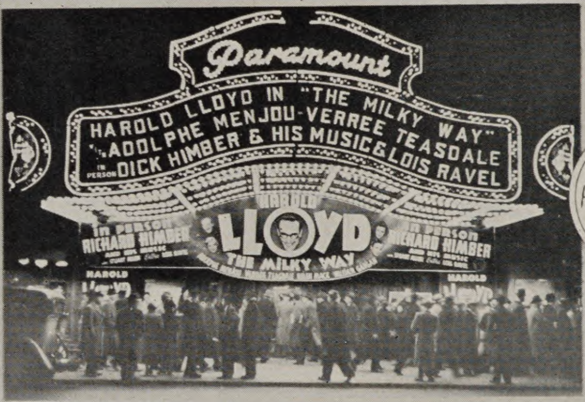
United Artists
RIVOLI
THE MOST TALKED ABOUT PICTURE OF THE YEAR !
"THESE THREE" WITH MIRIAM HOPKINS-MERLE OBERON - JOEL MC CREA
Miriam HOPKINS Merle OBERON JOEL McCREA These Three
THESE THREE

Photographed by GREGG TOLAND


Paramount
HAROLD LLOYD IN "THE MILKY WAY"
ADOLPHE MENJOU-VERREE TEASDALE
IN PERSON DICK HIMBER & HIS MUSIC & LOIS RAVEL
HAROLD LLOYD
THE MILKY WAY
IN PERSON RICHARD HIMBER

Photographed by AL GILKS

Paramount
ON SCREEN MAE WEST & KLONDIKE ANNIE
PLUS-PREVIEW OF A PARAMOUNT PICTURE
FRED WARING & PENNSYLVANIANS
MAE WEST IN KLONDIKE ANNIE
WITH VICTOR McLAGLEN
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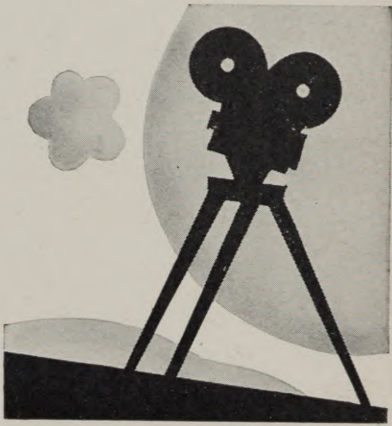

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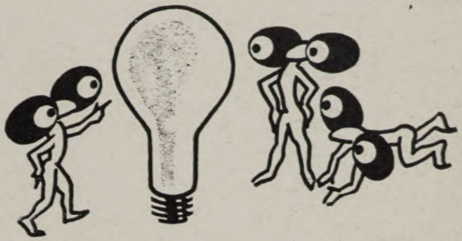

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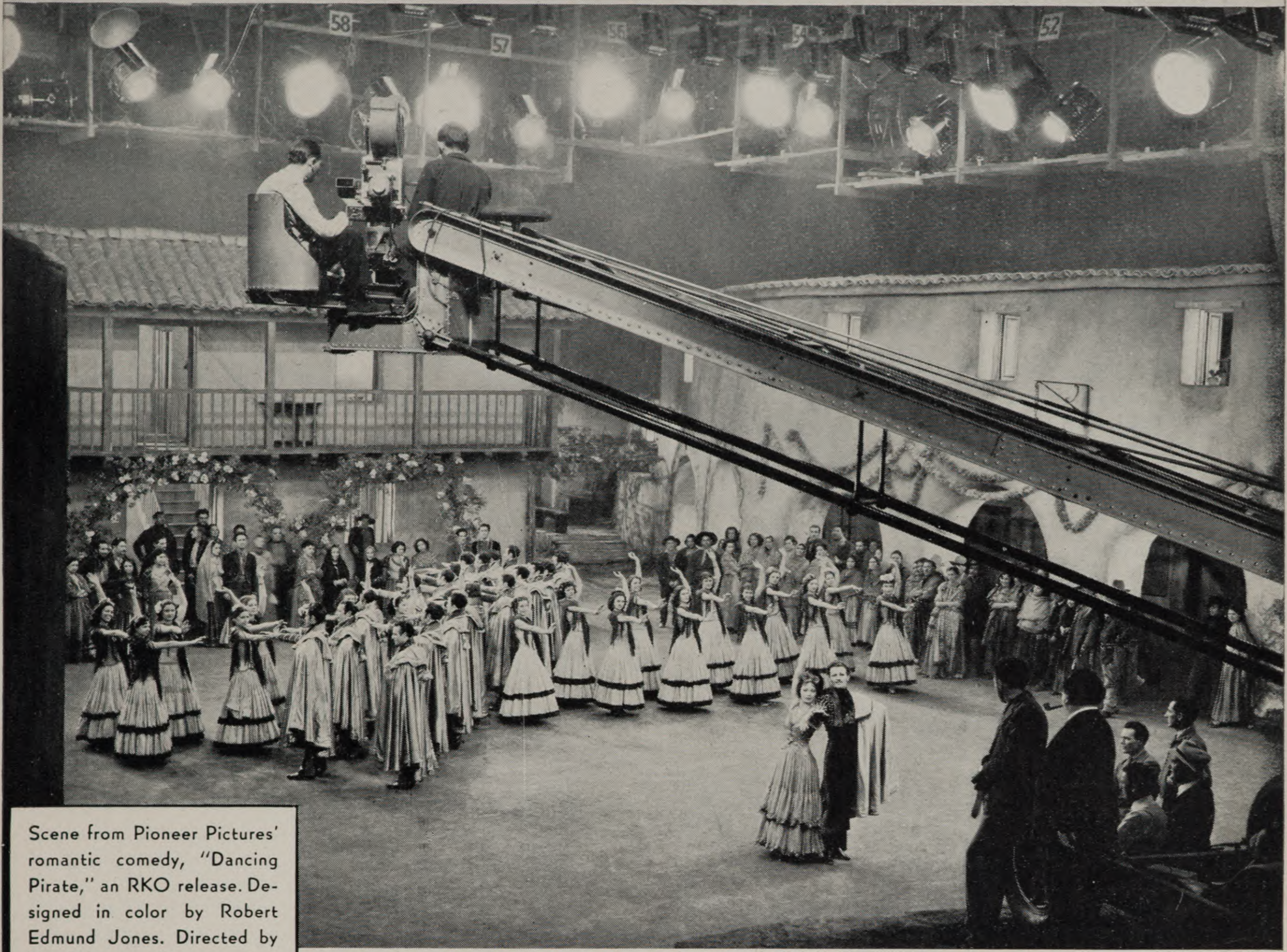

Scene from Pioneer Pictures' romantic comedy, "Dancing Pirate," an RKO release. Designed in color by Robert Edmund Jones. Directed by Lloyd Corrigan. Photographed by William Skall.

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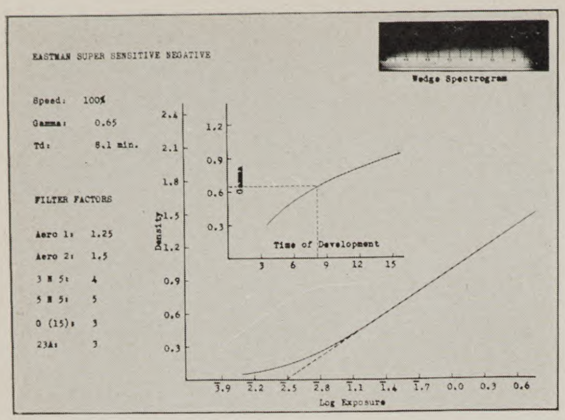


Fig. 1

IT IS GENERALLY ACCEPTED that photography is the foundation upon which the motion picture industry is built and it is not amiss to state that the negative emulsion is the foundation of photography. Primarily it is because of the importance of and the improvements in negative emulsions that photography has advanced to its present state. A decade ago camera and laboratory men were very little concerned with the color sensitivity properties of negative motion picture film, and panchromatic emulsions, while known, were rarely used.

In those earlier days orthochromatic negative film was generally used as the medium on which exposures were made. In conjunction with this film use was made of mercury vapor and arc lamps, since these light sources were considered the epitome in the field of studio illuminants. The orthochromatic negative emulsion, because of its blue sensitivity, was ideally suited for photography by the radiations emitted from the mercury vapor lamps, since the radiations from this lamp were very pronounced in the same spectral region. The carbon arc also emitted strong blue-green radiation and it was not uncommon practice to make use of both types of lamps in the illumination of a motion picture set. Since the orthochromatic emulsion was deficient in red sensitivity it mattered not at all that these light sources were deficient in this same spectral region. For exterior photography the orthochromatic film proved very satisfactory since daylight and sunlight likewise emitted considerable blue-green radiation.

It would be well at this point to digress and define more adequately the terms orthochromatic and panchromatic. A gelatino-silver bromide emulsion is normally only blue sensitive and unless the use of sensitizing dyes are resorted to, colors other than blue are inadequately reproduced. With the aid of dye sensitizing, emulsions may be rendered sensitive to other portions of the visible spectrum in addition to the normal blue sensitivity of the simple silver bromide emulsion. This silver-bromide emulsion having only blue sensitivity is referred to in photographic terminology as an "ordinary" emulsion. Using this type of emulsion as a basis for dye sensitivity research it was found that certain dyes rendered an emulsion sensitive to the blue-green, green, and yellow portions of the visible spectrum. Emulsions so treated by dyes as to produce this type of sensitivity are known as "orthochromatic" emulsions. The word orthochromatic implies that objects of different color brightness can be rendered in a truer gray scale than with ordinary emulsions. Further research in the field of dye sensitizing led to the discovery of certain dyes which have the ability to render an emulsion sensitive to the red region of the visible spectrum, this red sensitivity being acquired in addition to the blue, green, and yellow sensitivity of the orthochromatic type. Emulsions containing this additional red sensitivity are referred to as "panchromatic" emulsions, the word panchromatic implying that the emulsion has the ability to record colored objects in terms of grays in their proper brightness relationship. The Eastman Kodak Company first undertook the manufacture of panchromatic emulsion in 1912. These earlier emulsions for the most part were coated on glass plates.

As late as 1927 the majority of motion picture productions were made using orthochromatic negative with mercury vapor and arc lamps but from that date forward there was a steady trend toward the exclusive use of panchromatic films and light sources of the incandescent tungsten lamp type as well as high efficiency carbon arcs. The old type orthochromatic negative emulsion when used with incandescent tungsten lamps, exhibited far less sensitivity than when used with the mercury vapor arc lamps or daylight. It was natural, therefore, that a means be found to make use of this more efficient type of illumination. Since the field of emulsion sensitizing had progressed to the point where very acceptable panchromatic film emulsions could be manufactured, it was likewise quite natural that use was made of such emulsions. As was indicated above, the manufacture of panchromatic emulsions in this country began in 1912 but very little panchromatic film had found its way into the motion picture industry prior to 1927. It is difficult to state whether panchromatic film or tungsten lighting equipment first attracted the attention of the photographic world, since for years experimental research had been carried on in both fields, but it is interesting to note that both of them were brought forcibly to the attention of the motion picture industry during the latter part of 1927 and the early part of 1928. The real reason for this was due to the fact that the years of research in the two fields had reached a practical culmination at approximately the same time and since each was partially dependent upon the other, it is not difficult to understand their almost simultaneous introduction to motion picture photography.

It is impossible to discuss motion picture negative emulsions as they are now known without digressing for a moment for a discussion of another development in the field of photography which took place almost immediately after the introduction of panchromatic film and incandescent tungsten illuminants. Reference is made to the fine grain negative developer which was introduced to the trade by the Eastman Kodak Company in 1929. The reason that this discussion cannot progress without considering the developer situation is because of the fact that this developer single handedly played a very large part in the advancement of motion picture photographic quality.

In photography that chemical solution which is used to reduce the exposed silver bromide grains to metallic silver and thus make visible the effect of exposure is referred to as the developer. A developer consists primarily of a reducing agent, an accelerator in the form of an alkali, and a preservative, usually sodium sulfite. This does not imply that a developing solution contains only three chemicals since there are quite a few other chemicals which may be properly compounded to produce a developer which will give the desired degree of chemical reduction of the exposed film. In the days of orthochromatic negative a de-

# of Eastman Motion Picture Negative Films

by

Emery Huse, A.S.C.

Eastman Kodak Company,
Hollywood, California

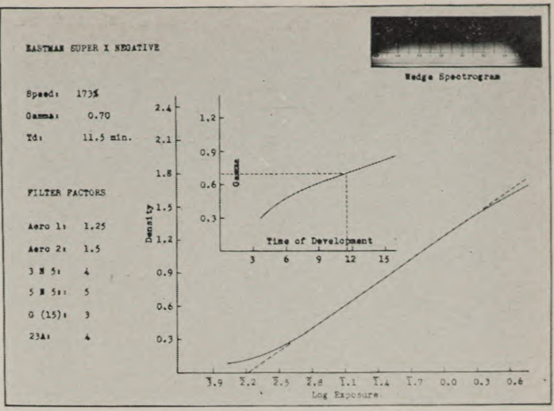


Fig. 2

veloper of a type which we would now consider extremely violent in its action was used. This developer and modifications of it consisted of the use of organic reducing agents, sodium carbonate as the alkali for accelerating the action of the reducing agents and sodium sulfite in just such quantities to preserve the developer against undue aerial oxidation. It was necessary that an active developer be used because of the limitations in the speed of the orthochromatic film and in the efficiency of the light sources. When, however, panchromatic film and incandescent illuminants were both available there were certain photographic quality deficiencies prevalent which it was felt could be eliminated by a different method of compounding the developer solution. Considerable experimental work had been carried on in the Research Laboratories of the Eastman Kodak Company and in 1929 a formula for the development of negative film, known as the borax developer, was offered to the trade. This developer differed materially from other types of negative developers in that its action was much less violent. Since it was known that sodium sulfite in excess acted as a partial solvent of silver halides, this fact was made use of. The borax developer consisted essentially of the reducing agents, the alkali and sodium sulfite in excess. Since a strong alkali causes a more rapid development and a greater tendency toward grain clumping during development, it was conceived that a weaker alkali would be an admirable partner for the silver halide solvent, sodium sulfite. This weaker alkali in the developer necessitated a longer time of development than had been customary with the old type of developers and this increased time factor gave the sulfite a better chance to get in its work. The combination of these two elements, namely, sodium tetraborate, (borax) and an excess of sodium sulfite, produced the real working factors of this new developer.

Since the panchromatic emulsions exhibited a fair speed characteristic the use of the borax developer did not cause any material disadvantages from the speed standpoint but the advantage derived was in the form of finer grain characteristics, which more than offset what at first seemed to be slight disadvantages. Because of the solvent action of sodium sulfite the borax developer produced somewhat less emulsion speed than the previous types. The very fact that this new developer came into use almost coincidentally with the introduction of panchromatic films and incandescent light sources made the problem of finally establishing a simple routine of practice somewhat more difficult. Not only were the cameramen involved from the standpoint of new lights and new methods of lighting, but the laboratory men also were confronted with the necessity of understanding fully the functions of the borax negative developer. The fact that panchromatic film, being sensitive to the entire visible spectrum, allowed for very little darkroom illumination further complicated this entire problem. In the light of our present day knowledge these factors are not considered difficult to handle but at the time of their introduction there were a considerable number of obstacles which seemed difficult to overcome.

During the first year after the introduction of these three new features, considerable progress was made. In a large measure the success of the application of these various technological aspects would not have been so satisfactory had it not been for the personal artistry of the cinematographer and the splendid cooperation of the laboratory technicians. To the men of both of these important branches in the motion picture field great tribute should be paid because they both gave considerable impetus to the production of high grade photographic quality to which we are accustomed today.

It was found that as time progressed the first type of panchromatic emulsion used for motion picture photography was not all that could be desired. While there was progress shown it was felt by the emulsion manufacturers that definite improvements could be made in the negative emulsion itself.

The first outstanding improvement in negative emulsions was made during the latter part of 1928, at which time the Eastman Kodak Company introduced Eastman Type II panchromatic motion picture negative film. This film when compared directly with its predecessor showed a marked improvement and was the first real step in the direction of finer photographic quality. As time passed and the use of the new illuminants and the new developer were better understood, it was found that this Type II negative also lacked certain qualities which it was felt could be overcome in a new type of film. In February of 1931 Eastman Super-Sensitive motion picture negative film was presented to the trade. This negative introduced a new era in the negative emulsion field. Not only was the quality of this film superior to that of Type II but its speed was materially greater. Under daylight conditions it exhibited twice the speed of Type II, while with normal set lighting it was nearly three times as fast. There was less contrast shown by this emulsion and a much finer graininess characteristic was in evidence. This film played a very important part in the fine photographic quality exhibited in motion picture production during the years 1931 to 1935. During these latter years steady advancement was made in the field of illuminants, during which time more efficient light sources of the tungsten type were manufactured. The functions of the borax developer were more thoroughly understood. Likewise by 1931 the use of developing machines for the development of negative film,

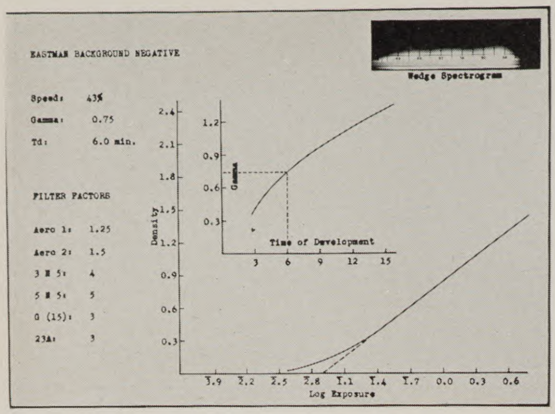


Fig. 3

as well as positive film, had almost completely supplanted rack and tank development in the major motion picture laboratories. Machine development in itself played a large part toward contributing to better photographic results.

Following the general policy of the Eastman Kodak Company to strive continually in the improvement of its products, there was manufactured during the year 1935 a new type of panchromatic negative film which was given the name Eastman Super X. This emulsion exhibited certain superior qualities to those of the Super-Sensitive film in that a speed increase of approximately 75% was shown, together with a slightly softer characteristic and a definitely finer grain structure. This emulsion met with immediate approval after complete tests by the camera and laboratory men and at the time of this writing approximately 95% of the motion picture productions made on film of Eastman manufacture are photographed with this new Super X Panchromatic Negative.

The emulsions which have just been described are in a sense in a direct line of succession since each new one replaced the older one completely for the purpose of normal motion picture work. However, there were other fields of endeavor open to the emulsion manufacturer. During the years 1931 to 1934, particularly, considerable experimental work, as well as production work, was being done in a new field known as the Projection Background Process. This process more or less completely superseded other special effect processes which had been in use for several years. The fundamentals of the projection background process are extremely well known but some details of it have escaped general attention. Since the process of rephotographing a projected image on a translucent screen is essentially one of duplication it may be readily observed that any step toward the elimination of the emulsion graininess characteristics would be desirable. It was conceived that a negative emulsion with sufficient speed for exterior photography, since most soft background plates were exteriors, would lend to a greater improvement of the final results of this special process. An emulsion for this purpose should have similar color sensitivity characteristics to that of the negative but it should be dissimilar in that its grain structure should be materially finer. An emulsion for this purpose was manufactured and marketed under the name of Eastman Backgrond Negative. This was introduced to the trade in the year 1933. Compared with Super X Negative this emulsion has about one-quarter the speed and exhibits definitely higher contrast under equal development conditions. The graininess factor, however, was excellent and without question this film soon established itself as the finest grained panchromatic negative emulsion in general use in the motion picture field. It is today almost exclusively used for the production of projection background plates but other uses are being found for this film because of its very fine grained characteristic. In all the foregoing paragraphs there has been presented a miniature chronological history of the factors which have lent themselves to the achievements in photographic work which are possible today in the motion picture field. While it is the purpose of this paper to discuss particularly the current Eastman motion picture negative emulsions, such a discussion could not be given satisfactorily without devoting considerable time to a discussion of accompanying developments along other lines. Since it is felt that the historical side of this problem has been established, it is now possible to proceed with a discussion of the photographic emulsions themselves and the differences which exist between them.

The original panchromatic motion picture negative film as introduced in 1927 and the later Type II film, although of more recent origin, are more completely removed from the motion picture field of photography than the old type orthochromatic negative, since this latter film is still manufactured for certain laboratory purposes. It is interesting to note that for such purposes this film is rapidly becoming obsolete. The three Eastman motion picture negative films now available are Super-Sensitive, Super X, and Background. A detailed graphical and quantitative comparison of the characteristics of these three emulsions may be had at a glance by a comparison of Figures 1, 2, and 3. It will be observed that the color sensitivity difference between these emulsions is slight. The Super-Sensitive and Background negatives are essentially the same in this respect. The Super X Negative differs slightly in that its red sensitivity is somewhat reduced. This fact can be readily determined by a comparison of the filter factors of the 23A (red) filter. The filter factor of this filter for Super X Negative is 4, while for the other two films it is 3. Since the filter factor is a multiplying factor for exposure, the larger that factor the lower the sensitivity. The data on these three emulsions were obtained under identical conditions of testing. Exposures and subsequent development were simultaneously made. These emulsions may be classified in the order Super X, Super-Sensitive, and Background Negative in terms of descending speed, while from a contrast standpoint the emulsions would range in the same order for ascending contrast characteristics. It will be seen, furthermore, that the characteristics of these three emulsions are tabulated for different values of gamma. This point needs some explanation. When Super-Sensitive Negative was in general use the average degree of development given it in the motion picture laboratories was represented by a gamma of approximately 0.65. Gamma is that characteristic of the film which indictates the degree of development. With the introduction of Super-X Negative and its generally lower contrast characteristic it was found desirable to raise the average gamma to 0.70, it being determined by practical test that the emulsion quality of this negative was greatly enhanced at this slightly higher value. This change in average gamma from 0.65 to 0.70 represents an increase of only approximately 8%. Since the Background Negative is inherently one of high contrast and since one of the purposes of the Background Negative is to produce a somewhat more contrasty result, it was found that an average gamma of 0.75 was desirable for this material. It should be well understood that these values of gamma are approximations since they represent the average extent of development of these films in practice. Departures plus or minus from these average values are naturally at the discretion of the individual user. The times of development to produce these average gamma values for each type of negative progress from the Background Negative, for which a short time of development

Continued on page 202

John Arnold Chosen President Sixth Consecutive Year

John Arnold A.S.C.

BY UNANIMOUS VOTE of confidence the American Society of Cinematographers in its annual election returned John Arnold to the high office of President for his sixth consecutive occupancy of this responsible post. His retention is fluent testimonial to the courageous and sound leadership, the untiring effort and the far-sighted diplomacy with which he has guided Society affairs through the troubled waters of the past half-decade.

So thoroughly, indeed, did personnel of the Society place its mark of approval on his administration that the entire group of officers and board of governors was re-elected to assure continued application of his policies.

Victor Milner was re-appointed First Vice-President, Charles Lang became Second Vice-President, James Van Trees, Third Vice-President. Fiscal accounts remain with Fred Jackman as Treasurer. Frank B. Good carries on as Secretary. Van Trees and Jackman are former Presidents of the Society.

John Arnold has captained the Society well during these five years. Unprecedented problems concerning the individual cinematographer and the profession as an entity have arisen and have been dealt with adroitly. The relationship of cinematographer and producer is of record through parleys and concurrences openly arrived at. As a result, the photographer enters upon the practice of his profession unharassed by commercial uncertainties. Minor misunderstandings, as must come to all contracting parties, have quickly and equitably been adjusted through the Society's good offices. The Society has become more adult in its outlook upon its own cinematographic craft and upon its integrant relationship to the motion picture enterprise.

Its imposition of high professional ethics has reflected prestige to the individual, the art and to the Society. It has acquired important recognition in the community, in the film industry and in cinema circles throughout the world. It has maintained increasing standards of technical, artistic and box-office production.

Touching upon his acceptance of a sixth term, which extended service is without parallel in Society annals, Arnold stated, "It is a fine compliment and a very appreciated honor from my fellow cinematographers. But I would slight this opportunity, if I failed to italicize that charting the Society's annual course has been the deed of no single individual. Fifteen representative members have cooperated at the helm. Your Board of Governors have given unsparingly of their time and experience, not always a simple matter under pressure of studio assignments. To them a full measure of tribute is due. Likewise, to the many members who have so freely contributed vital knowledge to the successful solution of technical, social and ethical problems.

"The Society during the year just closed found itself faced, as it does every year, with involved situations arising out of the constantly developing state of our industry. Calm, honest and tactful consideration of all interests resulted in still further security and solidity of our professional position.

"I am happy to see the Society assuming the proportions of an honorary professional guild, discarding any semblance to a mere trade group. Such an association of directly-concerned artisans having a unity of purpose can be expected to contribute importantly to the advancement of the common art. I believe the Society will make valuable strides in this direction during the coming year.

"More matters of academic concern will more thoroughly be scrutinized. We hope the Society, with its abundance of practiced technical and professional knowledge, may extend its inquiries deeper into realms of research. New mechanical devices, new methods, new optical applications may well be given exhaustive laboratory and field testing, with results accurately established for benefit of individual members, production heads of studios and the industry as a whole. Surely no group of men is in position better to render these authorative data.

"Various processes of color photography are forging their way to public acceptance. There is much the Society can contribute to the advanced application of this medium to motion picture entertainment. It is a topic of immediate interest to each member.

"Negotiation of prime working conditions can well be entrusted to those who have pointed these factors to their current amicable status.

"Happily, the Society is in sound shape financially. No administration officer derives remuneration for his services. We have no internal manouvering for personal gain. Cultural and social activities are developing. Public and professional recognition of our work is growing. A spirit of harmony and fair-play exists, with the desire of a square deal for the other fellow. We have neither chiseling competition nor restricting regimentation.

"Inclement weather lies behind us. Encouragingly bright days loom ahead for the cinematographer and for his Society."

Describing

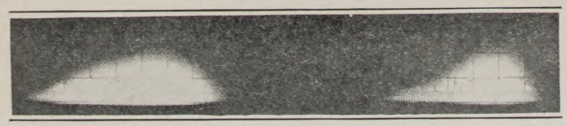


Figure 1: Spectrogram of Infra Red film.

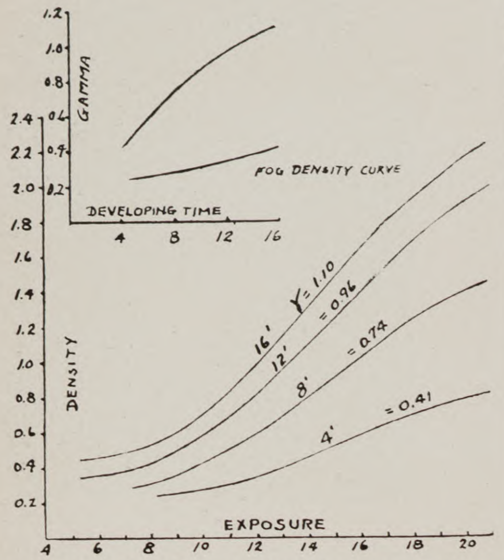
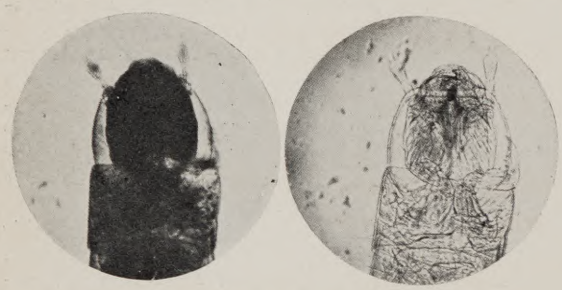


FIG. 2. Sensitometric curves on Infra-red film.



Bottom illustration: Microphotogram of head of worm. At left on Orthochromatic film; at right on Infra Red flim.

EDITOR'S NOTE: This is the second of the series of articles offered by this magazine describing outstanding achievements of the past year recognized by the Academy of Motion Picture Arts and Sciences in their recent awards. Sometime ago a detailed description was published of the Pola Screen.

THE BEGINNING of Infra Red photography dates back to 1905 with the discovery of the first sensitizers, Dicyanine and Dicyanine A, which extended the sensitivity of silver bromide emulsions past the red end of the visible spectrum. Today there are available emulsions in which the sensitizing maximum is located as far as 1050 m/u, and thus permitting the photographing of radiations up to even 1360 m/u.

Emulsions of this characteristic naturally aroused interest due to the possibilities they promise to offer in different fields of science.

Spectroanalysis of chemical elements and compounds succeeded in gaining additional valuable data and knowledge in regard to molecular structure by the use of Infra Red spectrophotography.

In the field of astrophysics, the availability of Infra Red plates enlightened explorers in many ways as to the atmospheric conditions surrounding stars and planets. From the photographs of the spectrum of Jupiter and Uranus, for instance, Infra Red absorption bands could be identified with those of ammonia and methan.

In the field of botanical research, the particular reaction of Infra Red sensitive photographic material towards reflected selective radiation has been utilized to create new methods of recognizing the beginning and progress of abnormal conditions in leaves as caused by certain types of fungi. In the medical field, and in that of microscopic research, (see illustrations), the same characteristics of Infra Red emulsions have been found to be of great value in the study of many different subjects.

Infra Red emulsions are equally interesting and useful in certain phases pertaining to pictorial photography as discussed in the following:

1. Long Distance Photography and Penetration of Aerial Haze by means of Infra Red Emulsions.

Light reflected from objects is partly scattered and diffused by the atmosphere lying between the object itself and the camera. In addition, the atmosphere, itself, sends out scattered light which is commonly observed in the form of the blue appearance of distant objects. Due to the first-named condition only part of the reflected radiation reaches the photographic material which causes a reduction of the original contrast in the reproduction. The scattered light sent out by the atmosphere records itself in the photographic reproduction in the form of a general fog over the entire picture, and thus further reduces the contrast.

Both conditions are increasingly noticeable for radiation of shorter wave length (blue) as long wave length radiation, (red and Infra Red) is far less scattered by the atmosphere.

This is the reason why Infra Red sensitive emulsions used with a lighter filter to absorb blue radiation will render long distance photographs especially clear and permit penetration of aerial haze to an amazing extent as illustrated by the accompanying pictures.

2. Photography of Night Effects in Daytime.

Blue sky does not reflect any Infra Red radiation. Therefore, if such a sky is photographed on an Infra Red sensitive emulsion by using a red filter, absorbing all blue radiation, the sky will be rendered completely black in the photographic reproduction.

Green foliage will, however, record very light for the reason that the chlorophyll present in all leaves and responsible for their green color, reflects Infra Red radiation to a large extent. The combination of these two reactions typical of Infra Red sensitive emulsions results in the fact that photographic reproductions of landscapes made in the daytime on film of this type create a strikingly similar impression to that of scenes observed in full moonlight.

It might be of interest to menton here also that Infra Red film, when used to photograph heavy cloud effects, will give many unusual and excellent results, which is a particularly valuable asset in aerial photography.

Afga's Infra Red Film

by
Dr. Herbert Meyer, A.S.C.
Agfa Ansco Corporation

The Agfa Ansco Corporation of Binghamton, New York, has perfected an Infra Red sensitive emulsion, available also in 35mm width, which has been used successfully in productions of Hollywood major studios during the past year. The importance and quality of this film type has recently been exemplified by the fact that one of the two highest technical awards from the Academy of Motion Pictutre Arts and Sciences for 1936 has been given to the Agfa Ansco Corporation in recognition of the merit of this product. Below is a short description of the characteristics of this film type as taken from an earlier paper delivered at last year's spring convention of the Society of Motion Picture Engineers.*

The general speed of Agfa Infra Red is approximately one-half that of Superpan, that is, when both types are exposed without filters and developed to the same gama.

This film type is not sensitive to green-yellow, which permits the use of relatively light red filters as it is only necessary that these filters absorb blue. The filter factor for Infra Red in combination with Wratten filters of the series 21 and following up to 29 F as found by practical tests and sensitometric comparison is of the order of 10 to 15. At standard motion picture camera speed, a normal exposure in full sunlight and blue sky on Infra Red using Wratten filter No. 25 will be obtained with a lens opening of 5.6. The use of deeper red filters is not recommended except for special scientific work as they unnecessarily prolong the exposure due to their lower transmission factor without rendering better pictorial quality.

Fig. 1 is a spectrogram of Infra Red film, indicating the color sensitivity over the range of the visible spectrum.

Fig. 2 shows graphs of sensitometric curves exposed on Infra Red film in an Eastman time-scale sensitometer, and developed for different times in a regular motion picture borax developer.

The gamma-time curve and the fog-density-time curve are also inserted in these graphs.

In comparing these sensitometric curves with those of

Continued on page 201

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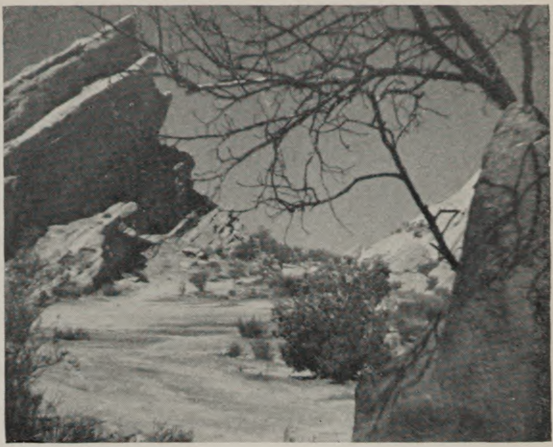
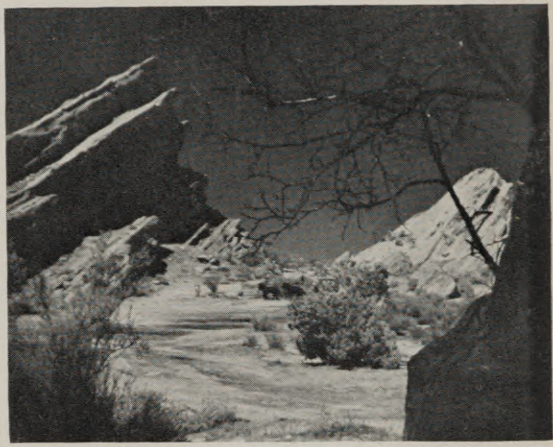
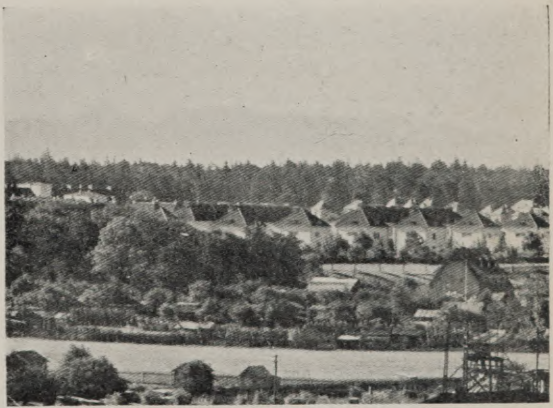
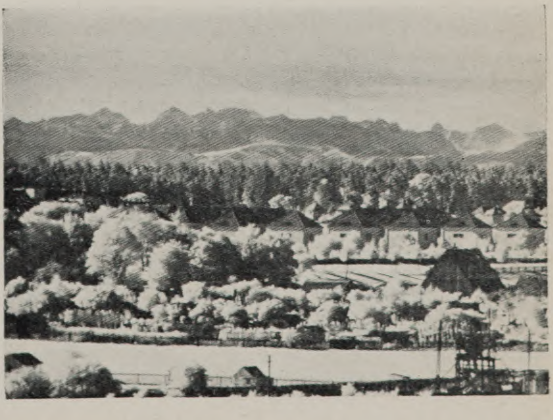
*Journal of Society of Motion Pict. Eng., Vol. 25, No. 3, 1935, Page 249.

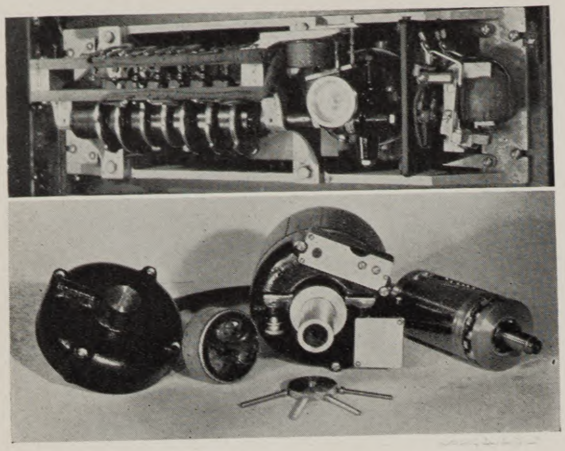








Top illustration: Supersensitive Panchromatic film with Wratten Filter No. 29F.
Second illustration: Agfa Infra Red Film with Wratten Filter No. 29F.
Third illustration: Orthochromatic plate with Agfa yellow filter No. 3.
Bottom illustration: Infra Red plate with Agfa Infra Red filter No. 85.



Top: Sequence switch which operates the automatic starting system. Bottom: 48 cycle camera motor disassembled.

Automatic Control for Starting Camera and Sound

by

William Stull, A.S.C.

EVER SINCE the intricate mechanism of talking picture production displaced silent film-making, a need has been felt for a method whereby the sequence of operations at the start of a sound "take" could be simplified and expedited. Under average operating conditions, one or more cameras and recording-machines must be started, synchronized, and brought to operating speed, scene and "take" numbers slated for sound and picture, synchronizing marks imprinted on both picture and sound negatives, while such auxiliary related operations as the stopping of ventilating fans, turning on of door signals, and so on must also be performed. As a rule, this inevitable chain of operations can rarely be performed in less than half a minute; if the company personnel is not perfectly coordinated, an even longer time lapse may occur.

The monetary value of the time thus lost can be considerable, especially when compounded to include the operations of a large studio for any length of time. The material wastage—especially film—will also reach a good-sized aggregate. Even more important, though less tangible, is the psychological effect of the delay, and its attendant confusion, upon the creative personnel of the company, whose work frequently depends upon maintaining a difficult emotional pitch from rehearsal to "take."

The Metro-Goldwyn-Mayer studio developed, and for some time has been using an automatic starting-control system which reduces these factors to the minimum. A single control serves to start and stop the entire system: the time-lapse interval has been reduced to four and one-half seconds.

Essentially, the device consists of a sequence switch, controlled by a single push-button switch on the set. In starting the system, throwing the master switch on the set starts the sequence switch, which is located in the sound building. This, in turn, starts the camera motors and recording motors, and operates relays which turn off stage ventilators, and turn on the warning signals outside the sound stage. As soon as the camera and recording motors are up to speed, the sequence switch operates a shutter on the recorder, permitting the recording light to reach the film. This shutter in opening closes contacts which operate a small fogging light in the camera; these automatically provide synchronizing marks on both sound-track and picture film. At the conclusion of this chain of events, a single-stroke bell is sounded on the set, informing the personnel that the system is operating.

In stopping the system at the end of the "take," operation of the control button again operates the sequence switch, which reverses the starting operations, making synchronizing marks, closing the recorder shutter, stopping camera and recording motors, starting the ventilators and releasing the door signals. This requires but one and one-half seconds.

If for any reason the control button is operated back and forth rapidly, the automatic system merely follows through the last instruction given it—that is, obeying the last position of the control button. Both camera and recorder can be operated off the system when necessary for slating, silent "takes," individual sound tracks, etc.

An important change brought about coincident with the adoption of this system is the use of 48-cycle, 1440 rpm. synchronous motors for driving the cameras. It will be recalled that in many installations, the camera motors run from 50 or 60 cycle power, and operate at a considerably higher speed, which necessitates the use of reduction gearing. The first camera motors used at the M-G-M studio, for example, ran at 3,600 rpm. from a 60-cycle supply. By using 48-cycle, 1440 rpm. motors, it is possible to eliminate the gearing, and connect the motor directly to the camera's shutter-shaft. This has done a great deal toward reducing camera noise, for it was found that a very large part of this noise came from the motor gears.

The studio's recorders were designed to run at 1,200 rpm., which necessitates a 60-cycle supply, while the power circuit supplying the studio is 50 cycles. Therefore a 50-60 cycle 60 KVA motor-generator set produces the 60-cycle three-phase circuit necessary for the recorder drive, while a 20 KVA 50-48 cycle frequency changer provides the three-phase 48-cycle current for the cameras. Since both of these units are powered from the same 50-cycle source, they and the equipment they power operate synchronously.

The camera motor gets up to speed in about two seconds, while due to the different nature of the recorder's mechanism, this unit requires about four seconds to start and settle down to a uniform recording speed. As these times naturally vary according to the load and other variable conditions, it is necessary to have some means of keying the sound and picture films together. This is done by means of the synchronizing marks made by the recorder-shutter and fogging ('bloop') light.

The shutter on the recorder is placed between the light-valve and the objective lens, and shuts off all light from the film. It is controlled electromagnetically, and opens or closes in about 1/250 second, thus giving a very sharp transition from an unexposed to a normally exposed track. As the contacts operating the camera fogging-light are me-

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Problems of Controlling Correct Photographic Reproduction

PART 6

by
Dr. Herbert Meyer, A.S.C.
Head of Hollywood Research Bureau,
Agfa, Ansco Corporation

THERE STILL REMAIN additional phases of photographic reproduction to be dealt with such as duplicating, lap dissolves, multiple exposures, background photography, and many similar interesting fields, which will only be mentioned here.

The cameraman whose name appears in the credit list as being responsible for the photographic quality of the picture should always be concerned about the excellence of these special procedures for if they interrupt the smooth continuity of otherwise fine material, they might create a bad impression on the public mind, and thus reflect unfavorably upon his reputation. The same is true of exceilent "dailies" which eventually suffer poor quality release printing, ruining the best pictorial efforts of those responsible.

All processes, such as dissolves, background projection photography, and general duplicating, involve producing a duplicate negative of either a part of or the original negative in its entirety. The two major problems to be solved in connection with this procedure concern that of graininess and resolving power. It is well known that any weakness in this respect, inherent to the original negative, will be greatly magnified in the duplicate negative. In addition to this, the matching of contrast and the preservation of the correct density level also demand particular attention.

The methods of making duplicate negatives vary greatly in Hollywood laboratories, although a standard method which would produce the best quality should be appreciated by everyone concerned. Few laboratories apply sensitometric control in the processing of duplicate negatives.

At present almost any type of low contrast emulsion can be found serving as material for duplicate negatives. They range from the fastest panchromatic and orthochromatic types to slow special dupe negative emulsions of positive speed, depending mainly upon the different theories adopted by the technician in charge as to the proper method to produce the best results.

All duplicate negatives are obtained by printing from a master print. The contrast and density level of the developed duplicate negative logically depends upon the contrast and density level of the master print, which as a rule is similar in density range and contrast to that of a regular black and white positive print, and correspondingly the dupe negative is developed approximately to the same gamma as the original negative to yield the proper overall contrast.

Consideration has also been given to another method which consists of developing the master print to a relatively low gamma in negative developer, and, therefore, requires a higher gamma value for the processing of the dupe negative. This provides an extended printing latitude in the master print, and also permits the use of relatively fast negative emulsions of high contrast, and, therefore, finer grain to produce the dupe negative.

A third possible method consistst of making a direct duplicate from the original negative by using the reversible process. This method undoubtedly should render the best quality as far as grain and definition are concerned.

Unfortunately, the quality angle in making duplicates commercially, suffers greatly from practical and economical restrictions.

In concluding this article, we would like to point the attention of the cameraman to an error quite frequently made by confusing the artistic and technical elements of his work. The cameraman should consider himself both an artist and a technician. As an artist his strength lies in his sense of intuition and his individuality. As a technician he should rely upon accurate knowledge of scientific facts and laws concerning or governing photographic processes. The latter has very little to do with art, which, however, is not commonly recognized.

Any technical instrument for instance, which is built and created to replace human judgment by automatic measuring devices, will be accepted by the cameraman, who is correctly technical-minded, as a true means of helping him to simplify his technical problems. In addition, he will recognize that the more such an instrument relieves him from concerning himself with cumbersome calculations, the more time he is able to apply to the study of his artistic problems.

The difference in rank should be solely judged from artistic ability. As far as solving of the technical problems is concerned, every cameraman is able to know and learn as much as his fellow worker, although it will be admitted that the success of practical application is always dependent upon personal talent and experience.

We still find, however, a large number among cameramen who show hesitation toward using automatic measuring devices, such as light meters or exposure meters, merely based upon the wrong conception that using automatic technical devices will unfavorably reflect upon their artistic reputation.

As previously stated, it is to be regretted that up to the present time the technic of correct photographic reproduction lacks quite a number of mechanical devices, which would help to obviate human error, thus preventing costly mistakes and also aid in distinguishing real artistic workmanship from pure skillfulness.

We tried in these articles to analyze the problem rather than to state the solution, which at its best, and not belittling the high progressive standing of photographic science and technic of today, could never be called a complete solution.

We intended to show the cameraman and the laboratory technician their specific problems from each others' viewpoint, and how vitally the success of either's efforts depends upon correct understanding and treatment of the

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Problems in Lensing European Projection Scenes

by
Harry Perry, A.S.C.

Harry Perry, A.S.C.

TRAVELING ABOUT EUROPE getting background projection shots is not without its moments for a Hollywood cinematographer. Almost anything may happen at the most unexpected time—and usually does. The American public is so picture-wise, and sympathetic cooperation in picture-taking is so easily obtained from all sources that the European obstacles which pop up without warning present trying situations, extra expense and serious production delays.

Not many weeks ago I arrived at the Italian border en route from Nice to Naples. With me was a camera car, camera equipment, an assistant and a driver. Advance arrangements had been made covering the entry of my party and the equipment through customs. I looked forward to getting my shots and being back to Paris within three or four days.

On that day the sanctions against Italy went into effect. Britain was being held responsible and I, of course, spoke English. Naples was the main port of embarkation of troops and war supplies to Ethiopia. My arrival with motion picture camera equipment, bound for Naples, was viewed with the greatest alarm by the border patrol and customs officials. They flatly refused entry for the camera. And there was nothing I could do about it.

I went on to Rome and besieged official bureaus for a temporary permit calling for immediate forwarding of the equipment. No one would accept the responsibility of permitting the camera to come in. They acted as though the request was a threat to Italy's very security. Day after day was spent in this futile search for some way of getting my equipment where I could use it. Meantime, the studio wanted those scenes of Naples.

One can't be in Rome many hours without realizing that a man by the name of Mussolini apparently has considerable influence in government circles. As a last desperate chance. I decided to appeal to him. In blunt, typical Yankee manner, I sat down and sent him a telegram. And waited to see what would happen. Attaches at my hotel were greatly concerned. Sending telegrams to Il Duce was a thing not being done.

The message brought fast action. The following morning I was requested to appear before the Minister of Propaganda. Entering his office, with misgivings as to what might follow, I noticed my telegram with a translation on his desk. I explained my predicament and mission. To my vast relief, I found him a sympathetic official.

The next morning my equipment was in Naples. So was I. And with me were two policemen. They saw to it that I got the street scenes I needed. They also saw to it that I went nowhere near the military zone. Italy has a censorship requirement that all motion picture negative exposed in the country must be developed and examined before leaving. But these police officers vouched for the innocence of my film to the censors and permitted me to ship it to Hollywood without interference.

So far as I could learn, there is very little picture production in Italy at present. There is much talk of the "second Hollywood" Mussolini is said to be building outside Rome. It will be operated as a government enterprise, as are most of Italy's industries. When it will start operations, no one could say.

In Spain, film production is at a veritable standstill. There is very little activity in France, beyond a few small independent outfits. England is buzzing with studio enterprise. The studios appear to have plenty of money and are going ahead with ambitious production plans. They firmly believe they can show Hollywood real competition. Their technical equipment, experience and talent seems to lag considerably behind ours, but is steadily improving.

There are many Hollywood studio folk in London. Those with contracts calling for good salaries say they enjoy working in England. Those out of work, and there are quite a few, naturally aren't so enthusiastic. The last thing a Hollywood technician should do is to go to London looking for a connection. There are more men, and good men, than jobs.

Continued on page 203

WORLD LEADER

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PANCHROMATIC NEGATIVE

Automatic Control for Starting Camera and Sound

Continued from page 196

chanically attached to the shutter, the time relation between the sound-shutter and fogging-light is almost perfectly uniform, and synchronizing marks are provided at both ends of a "take."

The fogging-light is a small switchboard-type lamp, mounted so that it exposes an area corresponding to the sound track, and has no effect on the picture proper. A condenser is connected in the lamp circuit, so that the first application of current from the recorder shutter gives a voltage surge which momentarily over-volts the lamp for about 1/24 second, giving a synchronizing mark which corresponds to the sudden opening of the recorder shutter. Connected in series with the lamp is a small buzzer, which operates when the fogging action takes place. In the rare event that the lamp should be loosely connected or burned out, the buzzer does not operate, warning the Operative Cameraman of the lamp failure in ample time to provide an emergency hand-clap synchronizing-mark for the "take."

A switch is provided on the camera-bungalow, which permits the Cameraman to change control of the camera from the automatic system to himself or vice versa, at any time. Thus in the case of an extra camera, the Operative may cut into the automatic system in the middle of a "take" and not only be perfectly synchronized with the sound, but have the automatic synchronizing mark placed at the end of his "take" in the usual manner. The reverse is also true.

The control circuits are of low voltage (12-volt D.C.), and the connections between the stages and the sound building control apparatus are simple and inexpensive. One sequence switch is required for each recording machine. Twelve of them are in use at the M-G-M studio. These switches consist of a familiar series of cam switches mounted on a common shaft which is driven by a 110-volt D.C. motor fitted with a quick-acting brake to prevent over-running. The cam designs and timing are calculated to match the operating characteristics of the devices they control. While such a switch is complicated in design and installation, its simplicity minimizes operating trouble and maintenance problems.

The sequence switches and recording machines are permanently identified with each other. Patching any recorder to a given stage involves only a conventional patching operation on the central distributing board, and automatically carries all the necessary connections for the control system to the stage.

Certain minor modifications have been made in standard recording machines to adapt them to working with this starting system. In addition to the shutter and its attached contacts already mentioned, it was necessary to place an electromagnetically operated clutch between the recording and the driving motor, to minimize the slow stopping which results from the flywheel action of the driving motor. The clutch engages upon the first application of power to the motor, and releases when the power is shut off. This makes it possible to stop the recorder in an interval equivalent to about six inches of film, while allowing the motor to drift to a stop.

As a matter of safety, a door switch is mounted in the recorder, so that the system, usually controlled from the stage, cannot start while the recorder door is open. A switch similar to the one mounted on the camera is also mounted at the recorder, and permits the recorder-operator to isolate his machine from the control system when necessary, or to control the entire system from his machine.

In connection with this system of controlled starting, an unique method of slating has been evolved. Slates are now photographed on only the first "take" of a scene. A log is kept by the Assistant Cameraman, recording the footage and "take" numbers, and including tests, etc. This log accompanies the film to the laboratory, where, in the title department, full-frame titles are made, corresponding to the slates required by the log. These slate-titles form the leader between successive scenes in the rushes, and naturally give a more easily read scene indication in projection and cutting.

In recording, visible-numbered raw stock is used. The recorder notes the key number at the start of a magazine, and thereafter logs each successive "take" in terms of footage and key numbers.

When the two negatives reach the laboratory, they are developed in physically separated departments. Thanks to this method of scene identification, the sound and picture negatives need never be physically associated. A standard length of title-slate leader is inserted in the picture negative, and an exactly equal length of blank leader in the sound negative. When the two negatives are printed, they will automatically be in synchronism with each other.

This discussion of the automatic-control starting system has, it may be noticed, been predicated upon central recording-plant operation. It is, however, equally applicable to portable units. In the portable installations, however, practical considerations arising from the problems of location units have made it advisable to substitute a hand-operated device for the electrically-operated sequence switch. It is equally efficient, and operates almost as rapidly.

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This system has been in use at the Metro-Goldwyn-Mayer studio for some time, and this year received Honorable Mention in the Academy Technical Progress Award. It was conceived by Douglas Shearer, A.S.C., and was developed under his guidance by the engineers of the Metro-Goldwyn-Mayer studio's Sound Department.

Describing Afga's Infra Red Film

Continued from page 195

supersensitive panchromatic types, it will be noticed that the gradation of Infra Red film is considerably steeper. Exposure of Infra Red film through red filters naturally causes an increase in contrast which was found to be approximately 7 percent, referring to increase in gamma values.

The sensitometric curves shown in Fig. 2 were developed using a green safelight, Agfa No. 103.

Green filters permit the transmission of Infra Red rays to some degree, and, therefore, cause fog on Infra Red sensitive emulsions during an extended development. This is evidenced in the fog-density-time curve shown in Fig. 2, which marks the rapid increase in fog density with extended developing time. For normal developing time, however,

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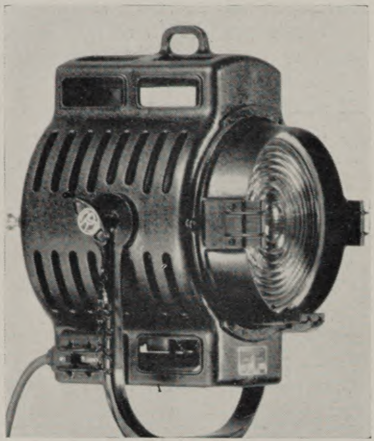

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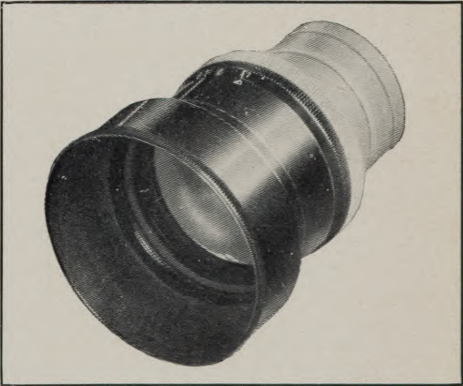

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it is permissible to use green lights with the ordinary precautions.

Agfa Infra Red film is regularly manufactured on a gray base for protection against halation.

Before this film type was available, all artificial night effects were made by using panchromatic films with heavy red filters. It is admitted that this combination will serve quite satisfactorily for this purpose in many cases, although it is not possible to reproduce on panchromatic film cold moonlight effects nearly so well as on Infra Red film. (See illustrations.)

Besides, the use of panchromatic film necessitates very deep red filters or filter combinations, the exposure factor of which is quite frequently impractical.

The technic of photographing night effects using Infra Red emulsions is not at all difficult to acquire. It should, however, be mentioned that full knowledge of the wide range of possible variations in contrast by use of different filters will greatly enlarge the usefulness of this product. In connection with this, attention is pointed to the fact that, for instance, moonlight effects are far more contrasty in the conception of the human observer than night shots, wherein the illumination is served by artificial light sources, such as street lamps or lighted windows. This fact alone requires a film material which offers a greater latitude of contrast than panchromatic types.

While it is true that Wratten filters No. 21 to 29F are to be used with practically the same exposure factor, the results obtained with the relatively lighter filter No. 21 differs noticeably from that rendered by 29 F in contrast. The lighter the filter, the lower the contrast. In using still lighter filters, such as yellow or green filters like Minus blue, G, Aero 2, or X2, the contrast will be found to further decrease, which can be utilized very successfully by the cameraman to suit his artistic conception of how he would like to have the reproduction appear in contrast.

In conclusion, it might be mentioned that contrary to former Infra Red sensitive emulsions, the Agfa Infra Red film is much more stable as far as speed, color sensitivity, and gradation is concerned, and will keep its original characteristic after manufacturing for at least one year under normal storing conditions.

The Characteristics of Eastman's Motion Picture Negative Films

Continued from page 192

is necessary, through the Super-Sensitive to the Super X, which requires the longest time. It was stated in a previous paragraph that Super X Negative is used in far greater quantities than the Super-Sensitive Negative. While this statement is true, it should be stated here that Super-Sensitive Negative film is still available for those users desiring this type of emulsion. However, indications point to the fact that before long Super-Sensitive Negative will be completely supplanted by Super X Negative.

Before leaving this subject it might be well to give some consideration to the various characteristics of emulsions and a bearing each has upon that intangible factor, photographic quality. There are many proponents to the idea that speed in a negative emulsion overshadows all other characteristics and that high speed is the most essential quality of a high grade negative emulsion. This is not true. Speed has a definite role to play because an emulsion must have sufficient sensitivity to record adequately low light intensities; otherwise a burden is thrown upon the cameraman in the lighting of his sets. Speed, therefore, while important, is by no means the major factor to be considered in a negative emulsion from the standpoint of obtaining photographic quality. When one stops to consider that the negative emulsions of four years ago were approximately one-quarter the speed of the current emulsions, one wonders now that pictures could have been made with those older type films.

In the light of our present emulsion knowledge, Super X Negative film represents the highest speed of present commercial motion picture negative emulsions consistent with excellent photographic quality. It is quite possible to make faster emulsions but not without a sacrifice of some of the other favorable factors. Photographic quality is a condition brought about by the combination of several elements, of which emulsion speed is but one. Contrast and graininess characteristics are the other factors of major importance.

It is generally well known among photographers that high speed emulsions usually show low contrast and large grain size. In a slower emulsion, high contrast and fine grain align themselves together. This is a very important point and should be given full consideration. It is quite possible that as emulsion manufacturing knowledge advances these facts now considered laws might be overcome but in the manufacture of gelatino-silver bromide emulsions, speed, low contrast, and large grain size usually go hand in hand. The one exception to this is the current Super X Negative. This emulsion shows a finer grain characteristic than some of its slower predecessors but it is extremely doubtful that a faster emulsion than Super X Negative could be manufactured without showing a greater tendency toward graininess. While it is admitted that great speed would allow for more natural set lighting, it does not follow that the quality of the resulting pictures would be better unless the negative emulsion had contrast and graininess factors comparable to those in the current type negative emulsion.

It should again be emphasized that statements relative to the possibility of manufacturing various types of emulsions depends entirely upon current knowledge. It is quite probable that as the result of more extensive research, emulsions of a distinctly different type may be conceived. If this is done, a new era in photography will begin and it will be as radical a departure from what we now consider normal as that of orthochromatic negative and mercury vapor lamps to the present type of films and the high efficiency incandescent illuminants. It is safe to conclude, therefore, that the Super X type of emulsion represents the current practical limit of speed consistent with good quality. It is not meant that speed increases of the order of 10 to 20% are not possible. When it is possible to manufacture emulsions of greatly increased speed with the other factors lending to photographic quality kept within control, it stands to reason that such a film will be submitted to the motion picture trade for production purposes.

Problems in Lensing European Projection Scenes

Continued from page 198

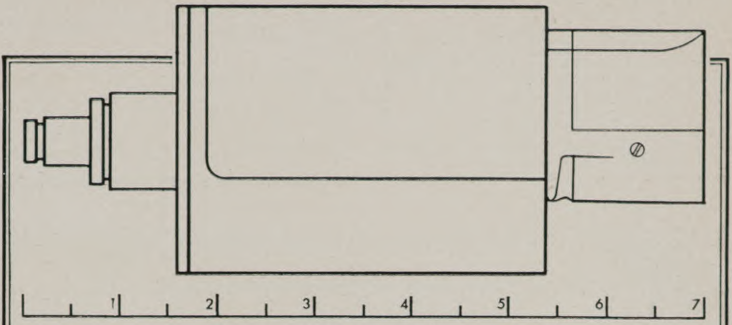
Working in London is much different than Hollywood. In Hollywood we have our own trade or professional colony. But London is so vast that the picture business is just another small industry, with its units lost in the busy city.

London public are more curious about cameras than the blase Hollywood public. Set up a camera anywhere and crowds instantly gather. The police, while most accommodating, look with frowns on the crowd assembling. Nor will they hold up traffic for more than an instant for you.

Officials know little about picture practice, and care less. I wanted permission to shoot in the Tower. The governor refused consent for motion pictures but helpfully suggested I take still pictures—"and animate them the way the cartoon lads do."

In England you must have a permit for every camera assignment. But they are easily obtained upon presentation of credentials.

Taking camera equipment from one country to another is a problem. Going



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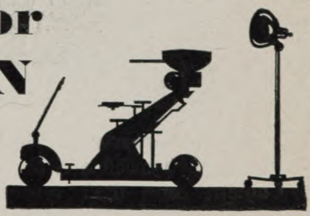

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into England, a duty tax of one thousand dollars was levied against my equipment. I debated the figure down to five hundred and fifty. But I didn't get it back.

Other countries allow camera equipment to enter under a temporary working permit upon posting bond of approximately two to three thousand dollars. It takes five days to a week for the permit to be issued. A shipping agent knows the ropes and can take care of details at minimum cost. The bond is returned when you leave the country.

Good negative can be had in London and Paris. If you go beyond these cities take your negative along with you. Local sources of supply can not be relied on.

You will find good mechanics in London, many of them Hollywood products.

Filters are of indifferent grade. Graduated glass filters are unknown. They use wet batteries instead of dry in battery boxes. With local camera motors, you dial up to speed and then hold it. Duty is so high, domestic motors are generally used.

If you are going to England or the Continent, by all means take complete equipment in your kit. Rental cameras are available, but you won't be happy with them. There are exceptions, of course. You'll be disappointed in weather conditions. I had three weeks of good photographic conditions in six months.

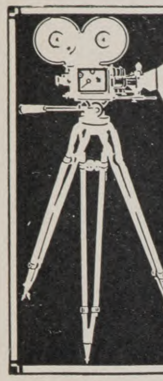
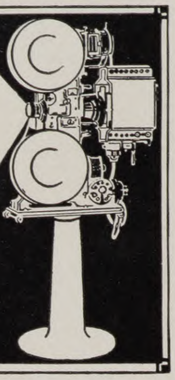
Schedules won't mean much. There is so much unavoidable delay. I had intended being gone ten weeks and was away six months. I traveled thirty thousand miles to get one hundred thousand feet of negative. Expenses will run well beyond your budget, and you can't prevent it. As you read this, I will be on the high seas bound for England, France, Switzerland, Austria and Italy to get background plates for Goldwyn's "Dodsworth." I am slated for ten weeks. I hope the schedule will hold. But I make no Hollywood engagements prior to next football season.

Problems of Controlling Correct Photographic Reproduction

Continued from page 197

limitations and difficulties related to the work of either part.

We hope that this communication will serve the intended purpose of encouraging and stimulating the man of practice to analyze his specific problems and to formulate from this his own ideas as to where and how the different manufacturers can help him in creating new instruments and improved products for the constant betterment of his work.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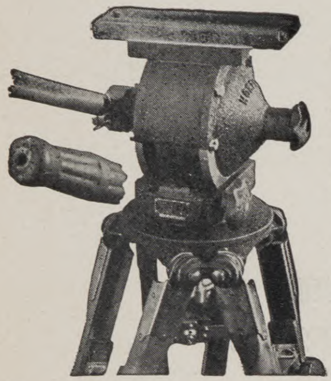

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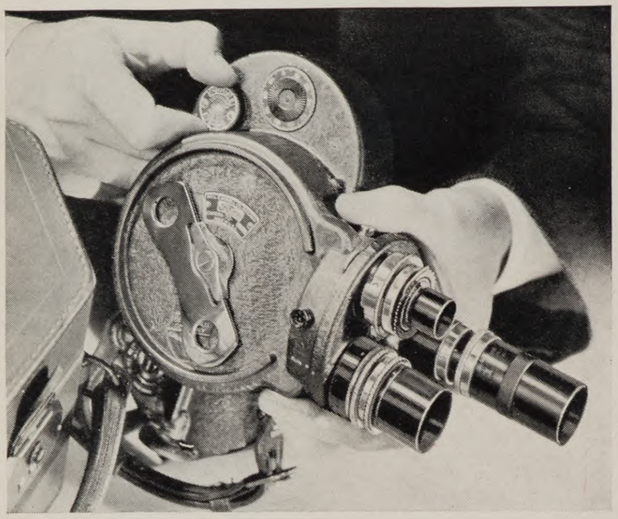

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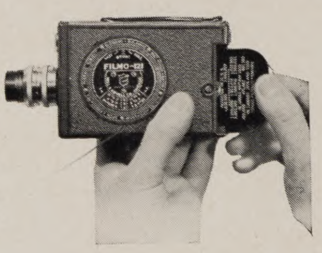

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AMATEUR
MOVIES

MAY,
1936

this issue

European Travel Notes
Filming Festival in Kodachrome
Making the March of Time
Substandard Miniatures
A Junior Society
. . . and other features

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Next Month . . .

- We'll tell you how they made the pictures come to life in "Curly Top." Here's something interesting you might want to try. There are several different methods outlined.
- Max Liszt, who told you all about Montage and Symbolism, will write about the ingredients of a successful picture. He speaks authoritatively because he has been a director.
- Camera angles will be discussed. You'll be told when and where to use them and how they are sometimes abused.

European

THERE MUST BE many photographic workers who have tentative plans for a trip to Europe in the backs of their minds but who know little about the ins and outs of the pursuit of their hobby in England and on the Continent. It is for their benefit, principally, that this collection of notes was assembled, but also for those armchair travelers who enjoy fresh, first hand information. The writer has spent the entire summer and autumn of 1935 with both cine and miniature cameras in eleven countries of Europe: France, England, Switzerland, Germany, Holland, Belgium, Italy, Austria, Hungary, Jugoslavia and Albania.

First concerning what equipment has been found to be most practical from personal experience and from the observation of other travelers. Miniature cameras are even more popular in Europe than in America; one sees them exceedingly often. It appears that, quite naturally, those who have them take the most pictures, since the larger cameras are so much more costly to operate and more trouble to prepare for action. Then, too, there is a great temptation with a larger camera to "leave the camera at the hotel, we won't see anything worth taking." It is usually on such occasions that one finds, regretfully, the finest picturing making opportunities. With a miniature camera, whose weight is hardly noticed, the temptation to go camera-less is greatly minimized.

The same rule applies to motion picture cameras. Don't make the mistake of carrying one of the large turret model multi-lens cameras through Europe. These instruments are, of course, the very finest obtainable for studio, location, and around-home work but for travel purposes, unless one be a professional or semi professional traveling slowly and with the express purpose of making movies, they will be found far too bulky and heavy.

It is not once in a hundred shots that the average traveler has occasion to use a telephoto lens; even when an occasion does present itself there is seldom available a sufficiently firm support for the camera. A wide angle lens, on the other hand, is very often of use, and in addition to a wide aperture normal focus lens will be found adequate to meet practically all filming conditions encountered in traveling. The time and trouble necessary to screw in lenses will be found fully compensated for by the saving in bulk, weight, and expense gained by the omission of the turret.

Reverse motion, multiple speeds, and other extras might occasionally be found useful, but the average traveler would do well to spend the time he would otherwise devote to the operation of these non-essentials to a careful selection of material and the planning of sequences.

To summarize, the ideal outfit would seem to be a miniature camera using a readily obtainable size of film cartridge; a lightweight 8 or 16 mm cine camera equipped with normal focus and wide angle screw-in or clamp-on mount lenses; filters; and a photoelectric exposure meter.

Next, as to customs formalities with regard to cameras and equipment. The writer carried in his luggage up to 1500 feet of 16mm film, 500 feet of 35mm film for loading into a miniature camera, and developing equipment for the miniature films, in addition to the two cameras, and no difficulty was experienced at any frontier, although customs officials often desired to know the purpose of the equipment. The right of each country to demand a bond equal to the customs duty was never exercised.

The most important fact with regard to customs is that all photographic apparatus must, for the protection of the owner, be declared. If declared, it is, in the experience of the writer, always passed through free of duty, but if not declared and later found, it is almost sure to be confiscated and with no hope of recovery save by repurchase at a high figure.

Thirdly, it is important to bear in mind that there are restrictions upon the photography of certain subjects in Europe, just as at home. These usually work no great hardship upon the amateur, but they should be constantly borne in mind. Due to the unsettled conditions in some parts of Europe, much trouble could be caused the photographer who unthinkingly takes a picture of a fortress.

Notes for the Amateur Traveler

by

William James

The principal specific restrictions are as follows: It is forbidden to make any photographs whatsoever from a moving airplane in any part of Europe. Forts, military works, military lands, and in some countries even railway stations, trains, and bridges are taboo. It is well to obtain specific permission to photograph parades, troop movements, or military men, as it is forbidden in some countries and perfectly allowable in others. Art galleries, museums, and cathedrals usually demand that special permission be obtained and a fee paid if one is to photograph works of art or objects of interest.

One should bear in mind if one's tour includes Italy, that all film which is to be sent by parcel post from Italy must be censored in Rome, which is both costly and bothersome. Film which is to be carried out as baggage does not need to be censored.

Unprocessed cine film, if it is of American manufacture and purchased in America, may be sent back to the United States for processing free of duty. Upon processed cine film, however, duty must be paid if it is sent by post, but all films in reasonable quantity, whether processed or unprocessed, are admitted free of duty if brought in as baggage.

Film will be found available in all the popular sizes in both American and European brands in nearly every town and city in western and central Europe. This includes daylight loading cartridges for 35mm cameras. Sixteen millimeter cine film is available only in the larger cities, and will be found to be more expensive than at home, and unless one obtains Kodak or Agfa one is never quite sure of the speed or the uniformity of the emulsion.

Fine grain processing stations for miniature negatives are to be found in western Europe with much greater frequency than in America, particularly in Germany and the German countries. The charges average about 25 cents for a five-foot roll. It hardly pays, at this rate, to attempt to do one's own processing as one goes along. The chief difficulties are: the formation of precipitates by the water in most cities when developer powders are dissolved in it; the impossibility of exact control of temperature so essential with tank development; and the time necessary, which must usually be stolen from other pleasures.

Light conditions will be found to be practically the same as in our northeastern states, with the exception that, in northern and central Europe the days in summer are much longer and in winter much shorter. There is sufficient light to make exposures on fast film with a wide aperture lens until nine in the evening in Paris and London in early summer, while farther north the day, of course, get progressively longer. In the winter, however, there is seldom sufficient light in these cities to do any serious work after three or four in the afternoon.

Perhaps the most important topic of all is what to expect with regard to picture material. First and foremost, don't expect to find natives in picturesque garb in the traveled parts of western Europe. Even in the small towns it is a rare occasion indeed when one sees a native costume. If one wishes to find this type of material it is necessary to go into eastern Europe, especially to the Balkans. Here one will find the last stand of the picturesque costume, which even here is rapidly vanishing.

Some welcome exceptions to the above generalizations are luckily met. In Austria and in Bavaria the men still unaffectedly wear their short leather knee breeches and "Tyrolese" hats, while the women, especially in the smaller towns, tend toward brightly colored and decorated dresses. In Belgium one sometimes catches a glimpse of a woman with voluminous black dress and lace cap.

In Holland one has the tourist towns of Marken and Volendam to fall back upon to get "quaint" material to satisfy "the folks back home". The ancient fishing villages, easily accessible from Amsterdam, have preserved their traditional costumes and way of life and now make their living from the tourist trade. They are so highly commercialized that they have lost much of their charm, but there is picture material in great abundance. It is altogether likely that the natives will demand a fee if they catch one photographing them. With a small cine camera or a miniature camera, however, one can usually "steal" a large number of shots, and these, being unposed, will be more interesting than the usual type in which the natives are apt to pose woodenly. It is particularly disconcerting to have them "strike an attitude" when one is attempting to get natural-looking movies.

There are still a few old fishing villages on the Zuyder Zee, most of them rather inaccessible, where the people still preserve their ancestral dress because of their innate backwardness and conservatism. The people are likely to be unfriendly and hard to photograph, but the results would well repay the trouble of a visit.

In Hungary, bordering as it does on eastern Europe, the

Continued on page 223

Filming an Aztec Festival in Kodachrome

by
Xavier Frias

MEXICO, my homeland, is rich in color. During the past few years, a revival of interest in the art and traditions of the ancient Aztec and Toltec civilizations has added to this. Throughout modern Mexico, the colorful heritage of Spain intermingles with the equally colorful Aztec influence. The result is a picture thoroughly Mexican: not wholly Spanish, by no means Indian in the generally accepted North American meaning of the word, and entirely charming.

For a long time I had cherished an ambition to make motion picture records of Mexican tradition and folklore, but not until the coming of Kodachrome did I dare attempt it. Any medium that ignored the living color of the scene would be sadly inadequate. But after seeing my first roll of Kodachrome, I knew there was available a process which would give me the pictures I wanted, and which was safe in my none too experienced hands.

At the same time, there arose an opportunity to begin by filming an unique Toltec festival, revived for the first time in over four hundred years. This festival dramatizes the ancient Toltec myth, "The Creation of the Fifth Sun". According to Toltec tradition, four suns had successively shone on Mexico, each as it died being renewed by the Gods. When the fourth sun expired, however, no successor appeared, and the land languished in darkness. All the invocations of the priests were in vain. Finally one of the High Priests cast himself into the sacrificial fire, and was reborn as the fifth sun. Last summer, twentieth-century Mexico re-enacted this pageant among the ancient Toltec pyramids at Teotihuacan, reconstructing ritual, costumes and pageantry with scientific accuracy. I resolved to film it in color; and by careful planning, I succeeded in capturing a Kodachrome record of the whole performance.

Here is how I went about it. First, I attended the many rehearsals of the pageant, familiarizing myself with the action. When the final rehearsals were held at the pyramids, I made it a point to be there, planning my scenes and angles. By this time, I was almost as familiar with the play as were the actors!

But it is one thing to familiarize yourself with the action of such a pageant, and quite another thing to photograph it when it is being perfomed before a vast crowd. The next step, therefore, was to assure myself of official co-

Continued on page 224

Surely, You'll Shoot the Circus

by
Barry Staley

"THE CIRCUS IS COMING TO TOWN!" A clarion call to every small boy—and to every amateur cinematographer. Here is a colorful spectacle providing an uncommon photographic subject. The circus is deep-rooted in boyhood tradition. Don't let your camera miss it. You'll have a chance to get many unusual shots, and the completed film will be a constant favorite with the children.

To have it an interest-holding bit of screen entertainment rather than merely a series of topical views, let's weave a story into it. Here's a suggested scenario that will give you good continuity and bring family personalities into the picture.

MAIN TITLE: CIRCUS TRAGEDY.

SCENE 1: (It is early morning, dawn. Use a Diffusion Filter and shoot it in full sunlight.) LONG SHOT showing the side of your home. Your small son's bedroom window is open. A string, weighted by a stone, extends from the window to the lawn. A young boy, a friend of your son's, runs rapidly into the picture and to the dangling string.

SCENE 2: MEDIUM SHOT of the side of the house below the open window. The string is now plainly visible. The young boy runs in to it, stops, and breathlessly takes hold of the string.

SCENE 3: CLOSE SHOT of the boy's hand tugging at the string in short, strong jerks.

SCENE 4: CLOSE SHOT, panning up along the line of the jerking string until it is seen to enter the open window.

SCENE 5: MEDIUM SHOT of your son's bedroom. He is in bed, sound asleep. The alarm clock registers the hour as six A.M. The string leads in through the open window to your son's big toe which is seen sticking out from under the covers. The string starts to jerk violently.

SCENE 6: CLOSE-UP of your son's exposed foot. The string is wound around the big toe and tied with a large knot. The jerking string is actively yanking at the captive toe.

SCENE 7: CLOSE SHOT of your son suddenly awakened. He grabs for his toe, and the string.

SCENE 8: CLOSE SHOT of your son jumping out of bed, string in hand, and going to the open window.

SCENE 9: (Exterior) MEDIUM SHOT of the open bedroom window. Your son is seen signalling out of it, cautioning silence, to his friend below.

SCENE 10: CLOSE SHOT. In the bedroom, your son flies out of his pajamas preliminary to fast dressing. FADE OUT.

SCENE 11: FADE IN on a LONG SHOT of the circus grounds with all the circus paraphernalia arriving. The two boys run in and scan the scene eagerly.

SCENES 12 TO 15: MEDIUM SHOTS of interesting circus procedure; unloading animal cages, erection of tent poles, etc.

SCENE 16: MEDIUM SHOT of the elephants. The boys come in and gaze at the big beasts admiringly.

SCENE 17: CLOSE SHOT of elephant drinking water from open trough.

SCENE 18: MEDIUM SHOT of the boys watching, fascinated, the drinking scene. A circus workman enters carrying two pails of water. He empties them into the drinking trough. Seeing the boys, he beckons to them.

SCENE 19: CLOSE SHOT of the workman giving the pails, one each to the two boys. They scamper away in the direction he points.

SCENE 20: CLOSE SHOT of the two boys filling the pails with water from a hydrant or other water supply.

SCENE 21: MEDIUM SHOT of the boys hurrying back to the elephants with their pails full of water.

SCENES 22 TO 25: MEDIUM and LONG SHOTS of circus activity. The seats are being placed, the "big top" goes up, the animals are being fed.

SCENE 26: CLOSE SHOT of the boys lugging their water pails. Their first enthusiasm has worn out and the pails are getting heavy.

SCENES 27 TO 30: MEDIUM and LONG SHOTS of the circus. The tents are now up, banners flying, the sideshow signs flamboyantly depicting attractions of its freaks.

SCENE 31: CLOSE SHOT of the boys. They are very weary and tired. They are using but one pail now, and laboriously carrying it between them.

SCENES 32 TO 35: MEDIUM and LONG SHOTS of the crowd arriving at the circus; at the ticket wagon, listening to the sideshow barker, entering the turnstiles.

SCENE 36: CLOSE SHOT of the boys and their water

Continued on page 222

Charles Herbert, A.S.C.

Making

MANY PEOPLE have wondered, since the first March of Time was flashed on the screen more than a year ago, where it is filmed, how it is filmed and how much of the content is made in regular motion picture studios.

The production of each March of Time episode includes most of the mediums which go into the ordinary newsreel, the feature picture and the travelog. Once the subject is selected and the story written in the first form, the editors map out the necessary sequences. It is often possible, in tracing past events, to secure certain stretches of film from libraries. For all current material camera crews are sent out and for reenactment, sets are built and the scenes are shot in a regular studio.

Examples of these various techniques may be found in almost any episode. Take the munitions sequences of the third issue for example. Senator Nye and members of his committee worked with March of Time's crew in filming their scenes. It was not so easy to get old Sir Basil Zaharoff, mystery man of Europe. Now an old man of 85, he is the most difficult person in the world to photograph.

The March of Time cameraman dispatched from Paris to get pictures of Zaharoff was well aware of the difficulties facing him. By posing as a taxi driver with a camera concealed in the cab, he obtained pictures of the munitions king descending the hotel steps, driving off in his car. When rumor had it that Zaharoff was planning to leave the Riviera for an unknown destination, this same cameraman got himself a job as pushcart peddler of refreshments at the railroad station. When the munitions king appeared in a wheel chair, he sauntered by, offered his wares to the plain-clothes man, while an automatic camera concealed among the oranges took the pictures which were later seen exclusively in the March of Time.

Most episodes, in addition to having national or international news importance, have some bit of human drama as an integral part of the story. For instance the CCC story which was released in the sixth issue starts with a mass meeting of the citizens of the little town of Elmsford, in protest against the invasion of CCC into their well-regulated community. This issue was reenacted and to make it as nearly perfect as possible, the citizens of the town were called upon to take the part of the crowd.. Actors from a near-by summer theater took the principal speaking roles including those of an Army captain and a chief of police.

The town hall meeting scene of this episode was made in the regular Town Hall and complete lighting equipment was installed. To make scenes depicting the rowdy element in the CCC ranks, the March of Time faced a problem. While the script called for these scenes and the editors were convinced of their importance, the Government officials were opposed to them.

Eventually March of Time was allowed to take the scenes in an authentic CCC mess hall. Later the CCC arranged forest fire scenes in the episode.

To do this great care had to be taken to see that the fire would not be a risk to the National Forest area. Under the expert supervision of the Forest Rangers, a cleared area was selected far away from the main body of the forest and a strip of forest was actually built. Trees were cut down and brought to the cleared area, holes were dug, and the trees were stuck up in as nearly natural positions as possible. Brush and grass were replanted and even old dead snags were mixed in with the green trees. Fire-fighting apparatus was brought out to stand by in case of an emergency, the area saturated with quick-burning liquid, and the stage was set. Two cameras were trained on the best locations, the fire started and as soon as it was going, CCC boys came up and did their job of putting it out.

Whenever a March of Time crew goes out on location, the men are prepared for most any kind of a job, with lights, electricians, carpenters, cameramen, soundmen, assistants, directors, etc. As much care is given to the production of scenes as goes into the making of regular feature pictures, each person faithfully doing his part in creating life-like action and sound on the film. Most scenes are made from every angle possible and when the developed film reaches the projection room for consideration by the editors, it must undergo a most critical scrutiny. The editors, not content to make their selection of scenes by merely viewing them as they come out of the camera, select several of the best takes, have them cut into the body of the proposed subject and then after reviewing the sequences over and over, select one which best tells the story in quick, sure-fire March of Time style.

Exterior scenes representing the full scope of Tennessee Valley Authority activities required two months of painstaking work over 8,000 miles of hill country in Tennessee, Kentucky, Alabama, and Mississippi. Every phase of work was covered and no scenes were made until location and backgrounds were checked to determine the one best suited to tell its particular story. As many of the striking activities were in isolated regions, it was necessary to travel over seemingly impassable roads.

The March of Time outfit which made this subject was equipped with a specially designed truck capable of negotiating the worst of field conditions. All built-in features for housing and operating the equipment were embodied in the design and construction of this truck. A removable top enabled the cameraman to stand in the

the March of Time

by
Charles Herbert, A.S C.

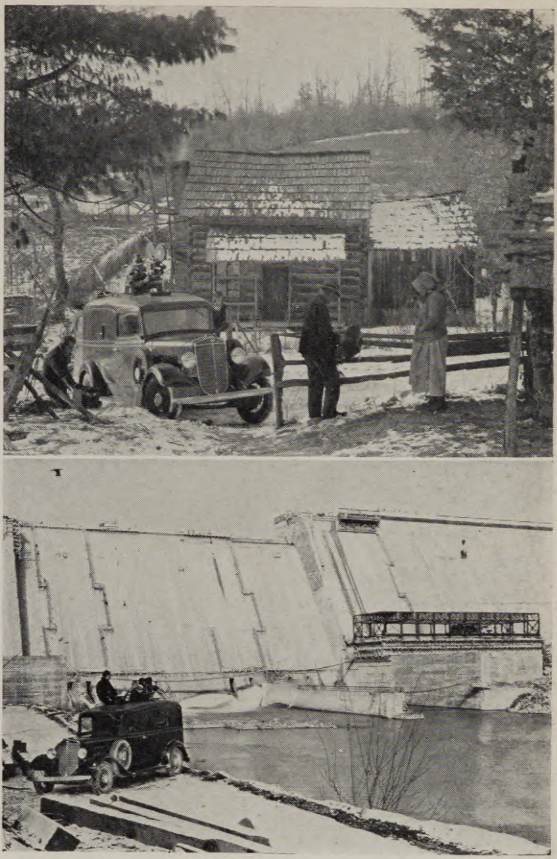
truck with the upper half of his body outside and the camera mounted securely in a built-in turret mount. When shots had to be stolen without knowledge of the people being photographed, the camera was mounted rigidly inside the truck and shots were made through a small sliding panel in the side. Various means of swinging the microphone into position were also provided. This truck will carry four people comfortably, a large supply of raw stock, complete lighting equipment for interior jobs, all kinds of tools for repairs to equipment and for use in preparing locations, special camera mounts, full sound recording equipment, plenty of baggage and still it is only a half-ton job.

The Ethiopian sequence in the sixth issue presented some unusual difficulties. As the threat of war became more and more pronounced and newspapers and newsreels started correspondents heading toward Ethiopia, this subject was selected as a definite part of the issue. How it should be presented remained a problem. Days went by and the rapidly developing events changed the story's importance time and time again. Finally the oil concessions and the news scoop by James Mills offered the real peg on which to hang the story. March of Time's cameraman was already in Ethiopia and a first shipment of film was on the way.

Realizing the importance of the coming crisis, the editors set about the long task of combing the library for scenes that might have bearing on the subject. They wanted to include the underlying causes of the conflict and show the nations involved. Although scenes of Lake Tana were needed, it was a problem to find them as the cameraman could not possibly make the trip to the mountains and return the film in time for the deadline. Also they could not afford to leave the hub of activity in Addis Ababa. Scenes of Abyssinia which would convincingly show what the country and its people were like were also needed, as were scenes of Assuan Dam and the River Nile, Gibraltar, and the Suez Canal.

Film libraries were canvassed and every lead was followed. Film from Ethiopia arrived but bad photographing weather had reduced its quality to uselessness. Occasionally an outstanding scene was found as hundreds of reels were projected. When the oil story broke there was a temporary relief from the seemingly endless inspection of existing film.

Newspapers carried a story of the strategic manouvre of Emperor Haile Selassie to cede away the fruits of conquest even before the conflict started. The first story of this important event was a world-wide scoop by James Mills. March of Time decided to reenact this scene. While news stories told how and where the signing happened, they left the public without a clear idea of how the stage looked. This was the cue that started every available man on the March of Time staff searching for information about Emperor Haile Selassie's Palace, how he looked, how his retainers dressed, what the hotel and telegraph office in Addis Ababa looked like, how the reporter and attendants dressed and a score of other details.



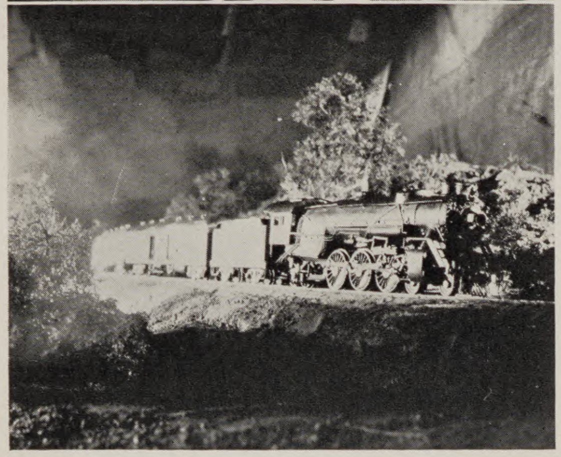
"March of Time" camera crews in back country of Tennessee shooting "TVA" story. At bottom: At Norris Dam in Tennessee on "TVA" story.

The reception office on West 54th Street was turned into a casting bureau as a stream of prospective doubles poured in. Retainers and minor characters were easy to select, but the Emperor, Rickett, Colson and Mills required care. A half dozen prospective Emperors were made up, viewed from every angle and under all lighting conditions. Then they were photographed on film and considered by the editors in the projection room. Jews, Italians, Syrians, and others were tested. None of the prospects made an impression on the editors until some one spotted the real Emperor right in the office. A young man in his twenties just starting out with the organization was made up and won the honor of being THE EMPEROR.

Before sets were prepared, extensive search was made for photographs showing construction details of the interior of the Emperor's study and the Imperial Hotel. As none were available a search was made for people who had seen the buildings. One of our soundmen had been in Ethiopia at the time of the coronation several years ago and his memory was taxed to get details of construction. Several negroes from Harlem were located who had some information about the hotel and a doctor who had spent many years in Addis Ababa filled in the gaps in a string of facts which made it possible to build sets closely resembling the real thing.

When the sets were completed, all the selected characters were called in and work started on the making of

Continued on page 223



Substandard Miniature Shots

by
Jerome H. Ash, A.S.C.

IN SEVERAL RECENT RELEASES, we have seen real people walking through miniature streets, and being crushed by the fall of miniature houses. We have seen real people acting against a background in which miniature trains, ships and airplanes moved. We have even seen real people acting on sets which were partly constructed in miniature.

Inevitably, amateur movie makers have asked whether or not they could film miniatures with their 16mm and 8mm cameras.

Well, some types of miniature work are possible with substandard equipment; others are out of the question until some manufacturer comes out with a camera incorporating such indispensable features as full-frame focusing directly through the film-aperture, a faster "slow-motion" speed, and so on. Even then, the more advanced types of composite photography, with which the professionals combine miniatures and full-scale scenes into a single shot, will have to remain on the amateur's doubtful list.

But all that is in the future: what can the home filmer do now, with the equipment he has today?

Generally speaking, the best type of miniature for the amateur filmer to tackle is what we can call "miniature inserts". Fairly distant shots of miniature trains, airplanes and ships, in which no people figure; and wrecks, crashes, and so on.

Let's begin with a few general rules about photographing miniatures. In the first place, always use your highest "slow-motion" speed. Photographing a miniature at an abnormally fast taking speed not only makes the pictured train, ship or airplane move more slowly, but it smooths out any irregularities in the motion, and somehow adds an illusion of massiveness and actuality. Second, always shoot your miniature from a relatively low camera-position: the lens should be, relative to the miniature being photographed, at about the level of a man of a size proportional to the scale of the miniature. To simplify the problem of set-building (the set should always be simple), it is preferable to make the miniature a night-effect shot, if possible. For much the same reason, the set should be lit rather flat while the miniature itself is lit with rather more contrast than usual; a fair degree of diffusion should be used. Lastly, wherever possible, the miniature should be under complete physical control during the shot.

Now, let's get more specific! Take the matter of miniature trains, for example. There are two types of miniature railways, both of which are more or less readily available to the home filmer. The first, of course, is the toy railway equipment the children look forward to at Christmas. The cheaper sort of toy trains aren't at all suitable for movie miniature work, but some of the better-class outfits—especially two or three accurately-scaled reproductions of various streamlined trains—should make pretty fair miniatures. Most of these outfits operate by remote control, which is a distinct advantage. Two kinds of track are available for them: the ordinary tubular "tinplate" track, and some with solid rails, which is quite realistic. These trains pick up their power from a third rail between the two running rails, so the camera must be used at an angle that won't reveal this rail.

The ideal trains for miniature-shots are the true scale-models. These are absolutely exact reproductions of real engines and cars, built to a scale of ¼″ to the foot. You can buy these miniatures commercially; but they are expensive. You can build them, or assemble them from kits, at less cost. And in almost every city, you can find men (some of them pretty distinguished citizens, too), whose hobby is building and operating these models; in the larger cities, you are almost sure to find model railway clubs. Properly approached, these people will gladly cooperate with you. Many of them have extensive layouts, complete with accessories and scenery.

Assuming you've got your train, the next thing is to photograph it. Your camera job will be much easier if the tracks are run along a bench, as in most scale-model layouts. This not only eliminates the back-breaking necessity of sprawling along the floor, but enables you to put your camera easily in the scale "eye-level" position that gives the best perspective. Supposing, too, that the model layout you use has some scenery, but no proper background, the simplest way to secure a proper sky background is to use a miniature version of the professional "sky backing". This is simply a sheet of white cloth stretched be-

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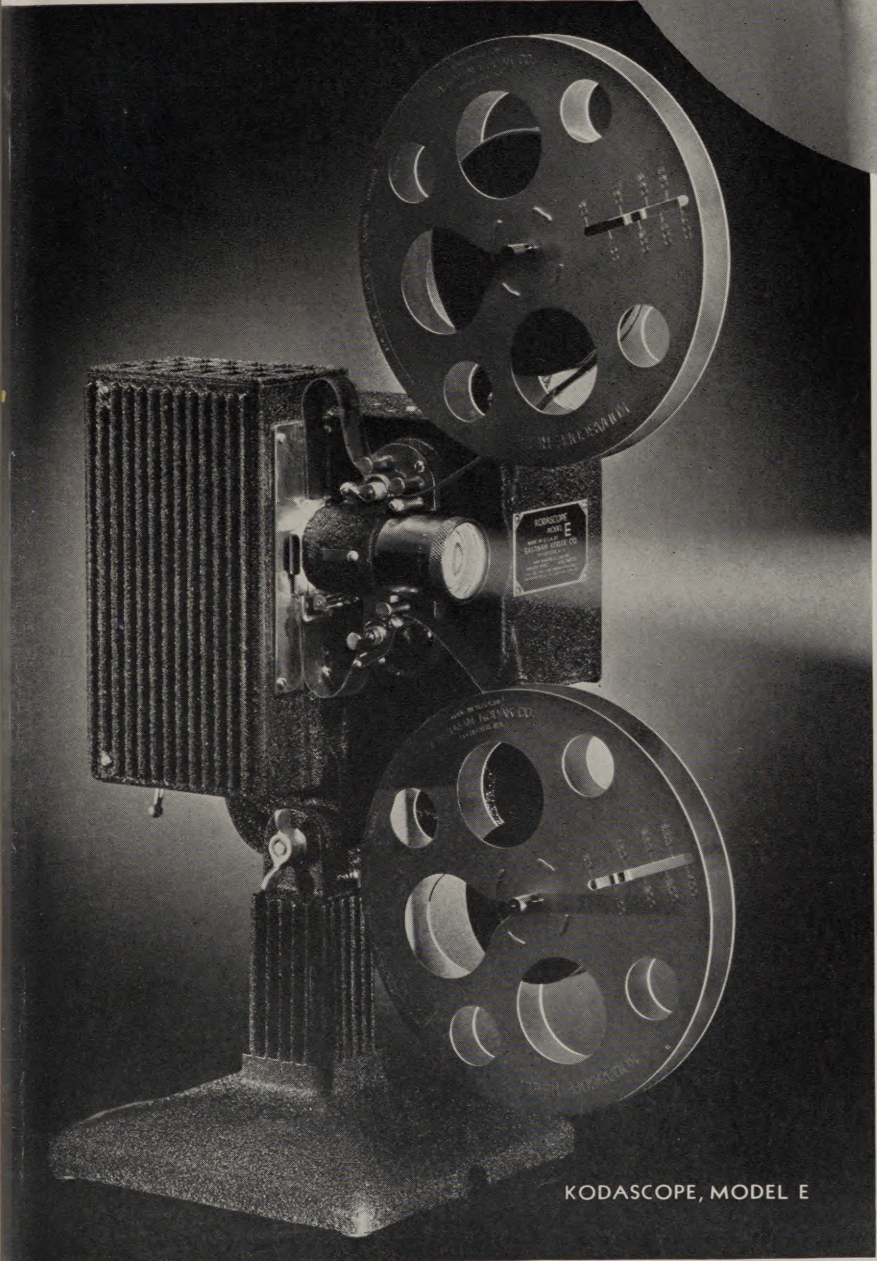
Better BRIGHTER MOVIES, WITH THESE EASTMAN HEADLINERS


KODASCOPE, MODEL E

Magazine Ciné-Kodak is the new 16 mm. camera that loads in 3 seconds. No threading—the film comes in magazines. "Pan," Super Sensitive "Pan," and Kodachrome Film magazines are instantly interchangeable—even when but partly exposed. Magazine Ciné-Kodak may be operated at half speed, normal, or slow motion. Its new design finder system competently serves the standard lens and four telephotos. These, and its many other advantages, have made it the fastest-selling 16 mm. camera almost over night. $125, with Kodak Anastigmat *f*.1.9 lens, at Ciné-Kodak dealers'.

Kodascope E, amazingly low in price and possessing exceptional brilliance and adaptability, already paces the 16 mm. projector field. It may be used with your choice of four "fast" lenses (1-inch to 4-inch), and three brilliant lamps (400-, 500-, and 750-watt). Little wonder that wise movie makers are buying the "E" at only $54.50 or slightly higher, depending upon lens-lamp selection.

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WHEELS OF INDUSTRY

Medical and Dental Films Catalog

● Bell & Howell Company has ready for distribution a new edition of its Medical and Dental Films Catalog—a listing of 16mm films on medical, surgical, health, dental, and hygiene subjects which are available, from their respective sources, for loan, rental, or purchase. Physicians, surgeons, dentists, nurses, teachers, and cinematographers generally, will find the catalog of interest and value.

Some three years ago this company issued its first catalog of medical and surgical films. It consisted of some twenty pages. An indication of progress and increased interest in motion pictures in this field is to be found in the fact that the new catalog lists approximately three times as many medical and surgical films as did the first one. Dental films listings have increased in like proportion.

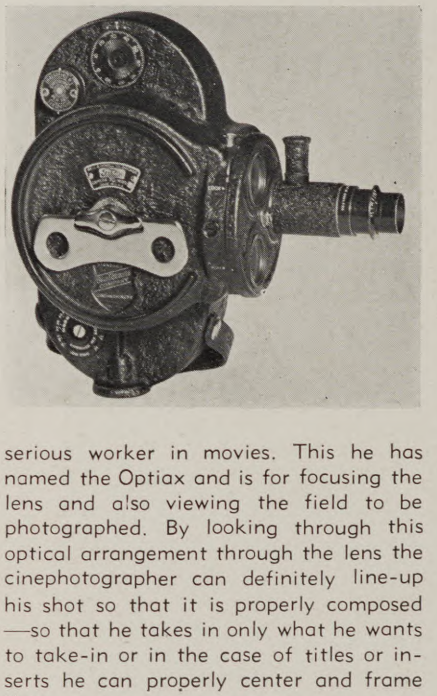
Significant is the appearance of a number of sound films among the silent films listed in this catalog. Beginning with the American College of Surgeons' original sound films on good hospital care, there are now several 16mm films available on the medical and dental fields, as shown in this catalog; and the number is rapidly increasing. The Hennepin County Tuberculosis Association of Minneapolis now has a two-reel sound film, "Contacts". In the field of child psychology a dozen sound films on Dr. Arnold Gesell's work at the Yale Clinic of Child Development are now available. In dentistry Dr. George B. Winter of St. Louis has made a sound film on the removal of the impacted third molar.

The contents of the new catalog fall under the following headings: (a) Medical and Surgical Films for Professional Use Only, (b) Health and Hygiene Films for National Distribution, (c) Health and Hygiene Films, Limited Distribution, (d) Non-medical Technical Films, (e. g. "Behavior of the Feeble Minded," "Determiners of Attention"), (e) Dental Films for Professional Use, (f) Dental Films, National Distribution.

The new Medical and Dental Films Catalog consisting of 58 mimeographed pages 8½ by 11 inches, with cover, will be sent on request to Films Division, Bell & Howell Company, 1801 Larchmont Avenue, Chicago, when the request is accompanied by 25 cents in stamps to help defray the cost of preparation and mailing.

New Focusing Device

● Arthur Wolf of Chicago has announced a very handy accessory for the serious worker in movies. This he has named the Optiax and is for focusing the lens and also viewing the field to be photographed. By looking through this optical arrangement through the lens the cinephotographer can definitely line-up his shot so that it is properly composed—so that he takes in only what he wants to take-in or in the case of titles or inserts he can properly center and frame them.



For those who must do definitely close-up work and they have no means of parallaxing the Optiax will undoubtedly prove very valuable.

Wolf makes them in several different models to fit the more popular type of cameras.

New Kodachrome Film

● Eastman Kodak Company announces a new type of Kodachrome film for use with artificial light.

Heretofore, in order to obtain satisfactory interior exposures with regular Kodachrome, the amateur had to use more light than the average house is fused to carry, and a blue filter was necessary to compensate for the redness of artificial light as compared with daylight. With this new type of Kodachrome, which is extremely blue sensitive, no such filter is necessary.

The film is about four times the speed, or two diaphragm openings faster than is the regular Kodachrome with artificial light and filter.

The new film is said to produce much more satisfactory color results by artificial light than have been possible before.

It is claimed to be fast enough to make pictures of illuminated street signs at night. Satisfactory exposures of such subjects can be made at f. 1.9 at the regular camera speed of 16 pictures a second.

The introduction of this film will also interest photographers engaged in medical work and indoor professional work. Heretofore, the medical photographer working with the aid of artificial light has had to use the compensating filter to obtain necessary color correction.

This new film, designated Kodachrome Film, Type "A", is balanced for the light of the inexpensive and readily available Photoflood lamps but will also render very excellent results with new regular tungsten filament lamps. For white flame carbon arcs the regular daylight Kodachrome film should be used. Since the new film is extremely blue sensitive, care must be exercised to exclude all daylight from the room when artificial light pictures are made.

Type "A" is similar to the regular daylight Kodachrome in that exposures must be judged fairly accurately to obtain the best results, and also the subject contrast must be kept low by the use of soft, flat lighting. This is because Kodachrome is very sensitive in registering slight differences in light and shade, or in shades of color; hence, the contrasty lighting commonly used for black and white pictures is not suitable.

An exposure guide for Kodachrome Artificial Light Film Type "A", with Eastman Kodaflectors accompanies the film. Type "A" may be also used in daylight with an orange filter to compensate for its blue sensitivity; its speed to daylight with the filter being about the same as regular Kodachrome without a filter. This filter will be available in the near future. The price of Type "A" is the same as regular Kodachrome film.

Continued on page 228

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A JUNIOR

for the Amateur

THE AMERICAN SOCIETY OF CINEMATOGRAPHERS has organized a junior branch of its association for the amateur to be known as the SOCIETY OF AMATEUR CINEMATOGRAPHERS.

FOR MANY YEARS amateurs have been requesting the American Society of Cinematographers to form an organization for them that would be representative, authoritative and instructive.

WHILE IT WOULD be easy to form such an organization in the spirit of enthusiasm that usually accompanies such pleas, but to insure the continuance of such an association it needs real ideals and a constructive policy.

THE SOCIETY OF Amateur Cinematographers is not a society to give to the amateur letters to be used after his name and it does not throw its membership open to everyone who has the fee to join. The Society of Amateur Cinematographers is based on strict and sensible requirements.

FIRST, THE APPLICANT must own a camera; second, he must have made motion pictures, and third, he must submit a picture to the reviewing board which is made up of members of the American Society of Cinematographers. This does not mean that the amateur is going to be judged by 100% professional standards as practically every member on the reviewing board operates either an 8mm or 16mm camera and is familiar with the shortcomings of the amateur's equipment.

WHEN AN AMATEUR has been admitted to the SOCIETY OF AMATEUR CINEMATOGRAPHERS, it is a sign of achievement; it is an indication that he is truly an amateur cinematographer, and he knows

SOCIETY

that his fellow members are active and accomplished amateurs. Also he is being guided by experts, by the acknowledged camera masters of the world, by Hollywood's greatest directors of photography.

MEMBERSHIP will include a subscription to the "American Cinematographer". It will also include the use of the outstanding films made by members of the Society of Amateur Cinematographers. As films are submitted, the best will be duplicated and an analysis prepared by a member of the American Society of Cinematographers. This analysis will go with the picture and the picture will be available to any member of the Society of Amateur Cinematographers.

FOR THE MOST outstanding members and the most able amateur cinematographers, a fellowship will be created, giving that amateur the title of Fellow of the Society of Amateur Cinematographers. Requirements for Fellowship will be announced later.

MEMBERSHIP IN THE SOCIETY of Amateur Cinematographers gives each member access to the film library, privilege of asking questions, and advice on all branches of movie making.

AS THE SOCIETY GROWS, it is the plan to create branches in other centers to be made up of members in those cities. In Hollywood a branch will be created and the programs originated here will go forward to other branches as a unit.

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Surely, You'll Shoot the Circus

Continued from page 213

pail. The job is proving beyond their strength. They sit down, utterly fatigued.

SCENES 37 TO 40: MEDIUM and LONG SHOTS of the circus crowd, thronging the entrance. Back around the dressing tent, clowns and other players can be seen in costume. The circus is about to begin its performance.

SCENE 41: CLOSE SHOT of the boys. With great effort they empty their water pail into the trough, slump exhausted to sitting positions and lament their condition.

SCENE 42: MEDIUM SHOT of the circus workman approaching the boys. He gives them their two promised tickets to the circus. Rewarded, the boys forget their fatigue and race merrily to the entrance gate.

SCENE 43: MEDIUM SHOT of the boys, tickets in hand, entering the circus portals, eagerly expectant.

SCENE 44: CLOSE SHOT of the boys taking their seats in the circus.

SCENE 45: LONG SHOT of the elephants doing their trick act.

SCENE 46: CLOSE-UP of the boys' faces, entranced at the sight.

SCENE 47: LONG SHOT of another circus act.

SCENE 48: CLOSE-UP of the boys watching. They are so tired they can scarcely keep their eyes open.

SCENE 49: LONG SHOT of another circus act.

SCENE 50: CLOSE-UP of the boys. They are fast asleep in their seats. FADE OUT.

SCENE 51: FADE IN on MEDIUM SHOT of crowd milling out of the exitway. The circus is over.

SCENE 52: CLOSE SHOT of the sleeping boys.

SCENE 53: MEDIUM SHOT of the sleeping boys alone among the vacant tiers of seats. A circus attendant enters and gently awakens them.

SCENE 54: CLOSE SHOT of the sleepy boys leaving the circus. They are very disgusted for they have slept through the entire performance.

SCENE 55: MEDIUM SHOT of the two boys making their weary way homeward. Their attitudes speak eloquently of the catastrophe of the unseen circus. FADE OUT.

By being on the scene the morning of the circus' arrival, you will experience no difficulty in getting these shots. The water-carrying episode can easily be arranged. Water for the elephants is such a legend of the circus that almost any attendant will gladly co-operate. Select the various circus scenes for their general interest and pictorial possibilities. The close-ups of the boys you can get later, if necessary, shooting

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against a neutral background or at a nearby baseball park that has seats of the circus sort.

If the interior of the circus is not quite light enough for sharp camera work, so much the better. Give plenty of exposure and you'll capture the atmosphere of the circus itself.

Making the March of Time

Continued from page 215

the reenactment scenes of the signing of the treaty, the hotel lobby, the hotel room scene, the meeting of Mills and Rickett and the telegraph office.

Most of March of Time's pictures, contrary to an earlier rumor, are taken by its own camera crews. Its men have covered the country photographing ex-President Hoover in California, a dope ring in New Orleans, CCC camps in Vermont, to mention a few places.

Abroad the March of Time has sent Julien Bryan to Russia, Japan, Manchukuo, and China for some of the best pictures so far to come out of those lands. In Palestine, I filmed the pictures used in the episode based on that country.

The subject has been called by many reviewers the chief innovation of 1935 in the short subject field. It is not competitive to newsreels although it has brought about audience comparison. It has established a reputation for news interpretation and exposition and in its editing and presentation it has undoubtedly achieved a brilliant success. The main thing to be desired of it in the future is that its second year will live up to the promises fulfilled in its first.

European Notes for the Amateur Traveler

Continued from page 211

small towns provide a gratifying amount of material, but the cities and resorts will be found to be standardized with regard to dress. In the Balkans little Albania is probably as unexploited as any country on earth photographically. It remains so unspoiled that it is practically impossible to look in any direction without seeing a fit subject for an interesting picture.

In the less sophisticated portions of Europe the market regions of any town may be relied upon to provide any amount of "human interest" material for both cine and miniature work. Since the markets are usually held in the open air, the light conditions are apt to be excellent, and furthermore the people are as a rule too busy with their own affairs to notice the photographer, who thus has every opportunity to obtain the finest "candid" material.

With regard to scenic beauty, ancient monuments and remains, and historical

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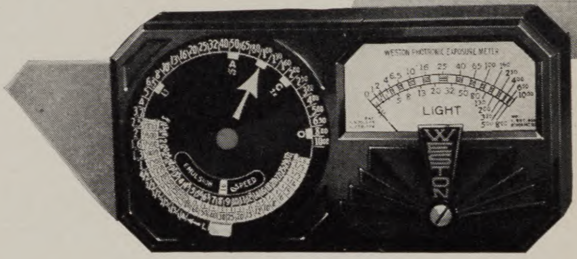

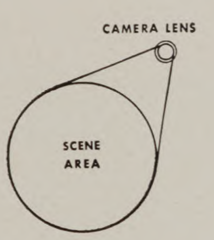

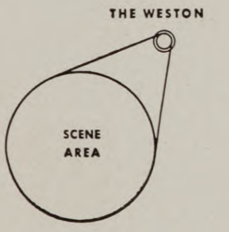

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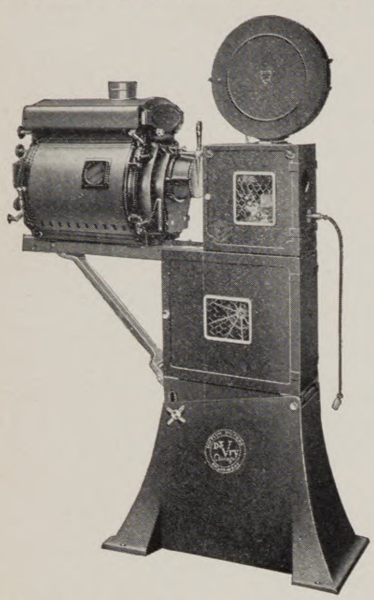

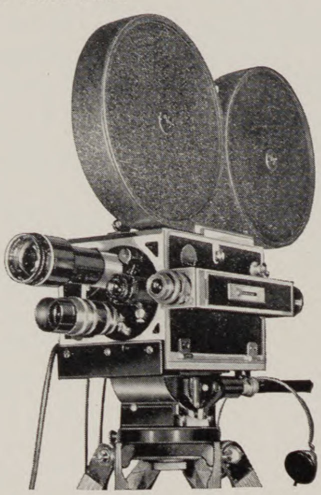

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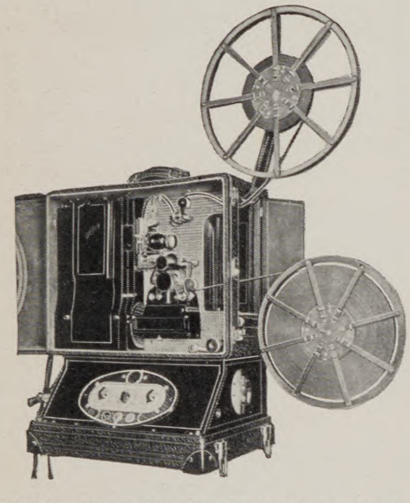

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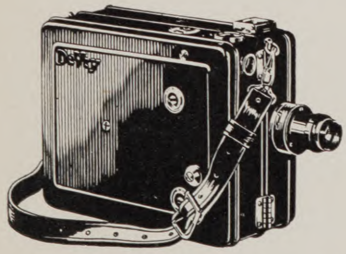

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subjects little need be said, for they present no special problems to the photographer. When they can be combined with human interest material without losing their original force, so much the better. It is well to bear in mind that the best pictorial effects are obtained with the sun relatively low in the sky; exposures made at mid-day are apt to be flat and shadowless in effect.

Finally, don't be afraid to take a lot of pictures. Film is cheap compared with the expense of travel. If you feel you may never return to a particular locality, preserve it for future enjoyment in pictures. Make an attempt to catch the spirit of each place and bear it away with you. When in London don't be content with snaps or movie shots of Westminster Abbey, Big Ben, and London Bridge. Get a candid shot of someone hopping a bus, of a "bobby" giving a tourist some directions, of an antiquated taxi, or of traffic jammed on the curve of Regent Street. These are pictures which live, and which tell their own story.

Filming an Aztec Festival in Kodachrome

Continued from page 212

operation. After securing the approval of the higher authorities, it was an easy matter to arrange with the officers who would police the area to hold for me two or three desirable (but inconspicuous) vantage-points.

Two or three set-ups, I decided, would suffice, for I planned to photograph only the medium-shots and long-shots during the performance. The pyramid area is too huge to permit getting good telephoto close-ups. Such close-ups, anyway, would not be satisfactorily effective, for one cannot be sure of either the composition or the technique of such shots unless he is more than ordinarily expert with tele-lenses.

Good close-ups, though, are a vital necessity—even in filming such expansive pageantry. So I arranged with several of the principal actors, and some of the dancers, to remain after the performance. Knowing the action as I did, it was easy to plan my "added" close-ups, and to film them quickly enough so that the actors weren't inconvenienced.

I also provided myself with a husky assistant to help me move my camera-equipment about speedily. The equipment itself was light: simply my Filmo, a sturdy tripod, my Weston meter, and half-a-dozen rolls of Kodachrome: but time was all-important to success, and an extra pair of hands would save much time in changing set-ups, re-loading, and the like.

Thanks to these preparations, the actual filming became a simple matter.

I knew exactly what was going to happen; I knew just which bit of action I wanted for my picture; and I shot my scenes according to plan. I couldn't, of course, plan the light-conditions in advance—but the exposure-meter took care of that for me.

My telephoto lenses were a great help in making this picture. I made most of my scenes with my 2" and 4" lenses, using the standard one-inch lens as a wide-angle objective. Interchanging the telephoto lenses naturally simplified the problem of camera-positions very greatly, for from one well-chosen viewpoint, I could reach out and get close shots of interesting action without delay. The Filmo critical focuser proved invaluable in making these shots.

I made my scenes rather long, for two reasons. First, of course, it would make the editing job much easier. Secondly, it would show things more thoroughly, giving the eye time to take in both the action and the unfamiliar costumes and setting. And in my country, we enjoy films that move at a leisurely tempo, for our lives are not lived at so high a speed as those of our neighbors in the north.

Making the close-ups separately not only enabled me to get my scenes more easily, but to make them more effective shots. I could stage things especially for the camera, getting full benefit of lighting, camera-angles and color-contrasts in a way which would have been impossible otherwise. And there was the pleasant security of knowing that although I was getting my close-ups as I wished, I was not spoiling the pleasure of a crowd by intruding myself into a picture of life as it was lived four centuries before cameras were invented.

This same, careful planning can simplify filming pageants and festivals anywhere. In all logic, all movie-making should be done with equal care, but as long as we make movies for pleasure, most of us will photograph logically only on films we regard as really important works!

Kodachrome camerawork has by now become so familiar to most of us that very little need be said about it. From my own experience, though, I can say that an accurate exposure-meter is essential. I have heard quite a number of suggestions as to what is the best Weston meter setting for Kodachrome; I generally use a speed rating of 3, except when the light is unusually clear and strong; then I set my meter at 4. In much the same way, when my subject is dark in color, I always use a setting of 3, but when the subject is light, I've found it better to set the meter at 4.

The flatter lightings are generally best—or rather, safest. When filming people, a side lighting is very nice if one remembers to increase the exposure a bit so that the shadowed side won't vanish into inky blackness. Using a meter for these shots, take your reading from the shadowed side; the sunlit side will take care of itself.

In landscape long-shots, a flat lighting usually brings out the colors more vividly, though a cross-light, with long shadows, makes hills and mountains appear rounder and more natural. You can get some very effective shots if you "frame" your composition with trees or rocks in the foreground, and expose for the more distant part of the scene. In that case, the foreground, unless in direct sunlight, will be more or less silhouetted, and lead the eye to the distance.

Frequently, too, I have heard people complain that Kodachrome does not reproduce the greens well. In general, this is true, though some of the more recent rolls I have seen show much improvement in this respect. Correct exposure, though, helps the greens very much indeed.

Many of my North American friends have asked me about the regulations governing the use of movie cameras in Mexico; whether films must be developed in the country, censored, and so on. These things apply solely to professional filming, for within the past few weeks, all restrictions upon amateur Cinematography have been lifted. The Government quite rightly assumes that the

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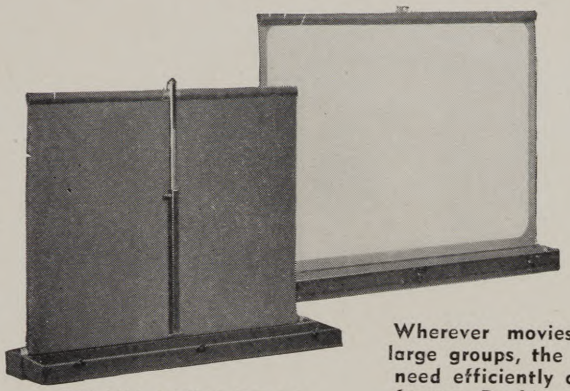

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amateur filmer is a gentleman; as such, they welcome him to Mexico, and ask only that he film nothing derogatory to the country. This is understandable, for my American friends have hinted to me that even here in your country, a prying camera could find scenes no good American wants filmed, for they are not representative of your country. Mexico has not enjoyed many of the advantages you in the United States have so long enjoyed, and it is inevitable that we, too, should have a few conditions which we do not like to see in pictures.

On the other hand, Mexico offers the cine enthusiast much that is unique—picturesque, colorful, and altogether different from one's accustomed scenes. And I can assure you, Mexico, as seen through the finder of a Kodachrome-filled camera is a photographic appetizer for the most jaded taste!

Substandard Miniature Shots

Continued from page 216

hind the miniature. The blue sky is painted in with gray paint (you can get any type of filter-correction by merely using darker or lighter paint!) and the clouds are merely unpainted white areas.

When it comes to lighting, you'll have to crowd in all the light you can get—and then use the fastest lenses and the most "super" Superpan film, for you will have to wind your camera up to its top slow-motion speed. Professional miniatures are photographed at from six to nine times normal speed. The average home-movie camera's top speed is 64 frames per second, which is only four times normal. This is not really enough: but you can "cheat" a bit, by running the train rather slowly.

The best angle is a ¾-front view, with the train approaching. If you are using scale-model trains, you had better shoot them from the left side, as they pick up their current from an outside third rail on the right, and the engine's projecting pick-up arm on that side will show in the picture, and look very incongruous. (If you look closely at the upper illustration, you'll see the pick-ups on the engines.)

So much for trains: now for model 'planes. If you are the father or brother of a boy over eight or ten years of age, you probably know all about model airplanes already! There are two types: the flying and the non-flying models. The flying type are often pretty accurate as to scale, but the non-fliers, when well built, are really perfect scale models of the big ships. Naturally, they are better picture-material.

I think that by far the most satisfactory way to handle miniature plane shots is to hang the plane from wires, as the professionals do. To begin with, stretch three parallel wires well above the path you want the plane to take: these are strictly for support. From these, hang a little T-shaped wooden framework, on pulleys or eyelets; this supports and guides the plane. From the framework, three wires descend to the plane—one to each wing, and one to the tail. The three-point suspension prevents the plane from turning or flying sidewise. The supporting wires may be rigidly fixed to the frame for some types of action, but you'll have more complete control of the model if the wires extend, like puppet-strings, to where someone standing beside the camera can manipulate them, altering the level and the inclination of the plane. With a little practice, you can make the plane land, take off, climb, glide, stall or sideslip, as well as "flying" level.

Of course the wires mustn't show in the picture. You will use fine piano-wire; sometimes this won't need any camouflage. It it only needs a little, you can often hide it by a light application of blue vitriol, which gives the wire a faintly coppery tinge. Incidentally, this is best applied with a piece of cotton, rather than a brush. You simply fold the moist cotton around the wire, and do your "painting" with a wiping motion. If the vitriol treatment doesn't hide the wire, go to the other extreme—what during the war was called "dazzle" camouflage. In this application, you paint the wire in little dots of alternate black and white, each perhaps half an inch long. You'd be surprised how well this will hide a wire!

Miniature airplane shots can usually be done outdoors, which simplifies the lighting problem for your high-speed exposure. If your model is a fairly good-sized one, the set-building problem will be simplified. For the background, if your location doesn't provide an adequate sky, or if there are fences, houses, etc., to be screened the sky bcking idea can be brought into play again.

Miniature ship scenes are a harder problem. In the first place, most of the ship-models you can get or assemble are relatively small—too small for really good photography; they bob around too nervously. Larger models take up more space; you need either a real lake or a swimming-pool in which to use them. And in ship miniatures, you can't "cheat" by moving your model slower to compensate for the camera's lack of speed for while you slow the forward movement of the ship, you can't slow its reaction to the ripples. And four times normal isn't nearly enough to magnify ripples into waves.

Otherwise, though, operating ship-

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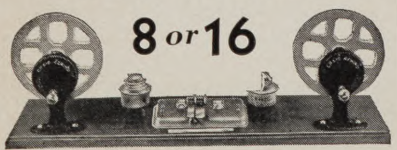

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models isn't so much unlike operating model planes. The ship should be towed by ropes or wires underneath the water. And as you can't move it fast enough to produce a realistic bow-wave, one can be painted on.

The problem of combining real people and a miniature shot is almost too difficult to tackle with amateur equipment. So far as I know the Cine Kodak Special is the only substandard camera (aside from the Berndt and Fearless professional sixteens) which permits focusing the full frame through the lens. But even this doesn't allow for lining up the way the professional does. Working in 35mm, we align the two shots by placing a piece of test-negative of one in the aperture of the camera, and focusing through the aperture, so that we make sure our people won't be larger than the train, and so on. Joining the two parts of the shot used to be done by various types of double-exposure and matte shots; but today it is done either by the projected background process, by optical printing, or by the Williams' or Dunning processes. None of them is particularly applicable to substandard requirements. The first two have been frequently discussed in the professional section of this magazine. The Williams' process is a process of printing through complementary traveling mattes, much after the fashion of the method suggested several months ago for making wipe-off mattes. The people are photographed against a plain background. From this negative, negative and positive mattes are made, and used in printing from the two negatives of background and people. In the Dunning process, the foreground action is photographed against a plain blue background, lit by white light. An orange-toned print of the background is run through the camera, in front of the unexposed film. The people are lit with orange light. The action of the process depends on the complementary coloring of the background and its lighting, the color of the background "plate", and the lighting on the people. The light reflected from the blue background prints a negative image of the orange-toned background plate upon the film in the camera; and where the direct image of the orange-lit people strikes the film, this prints through as though the orange-toned matte did not exist. The result is a composite, showing the people moving in front of the moving background.

Obviously, these can't be worked with substandard cameras.

The remaining possibility is simple, straightforward split-screen double exposure. In this, a matte is used in the camera (preferably right in front of the aperture) to divide the field. At one take, we make the right-hand side, perhaps; at the second, using a matte

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which is exactly the reverse of the first, we make the rest of the picture. In miniature work, however, we have the problem not only of matting our two exposures accurately, but of getting the people and the minature to the same relative scale. With a professional camera, we can focus with a frame of test negative of the miniature right in the focusing aperture; but with amateur equipment, the problem is too difficult for anyone but a student of higher mathematics.

Wheels of Industry

Continued from page 218

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